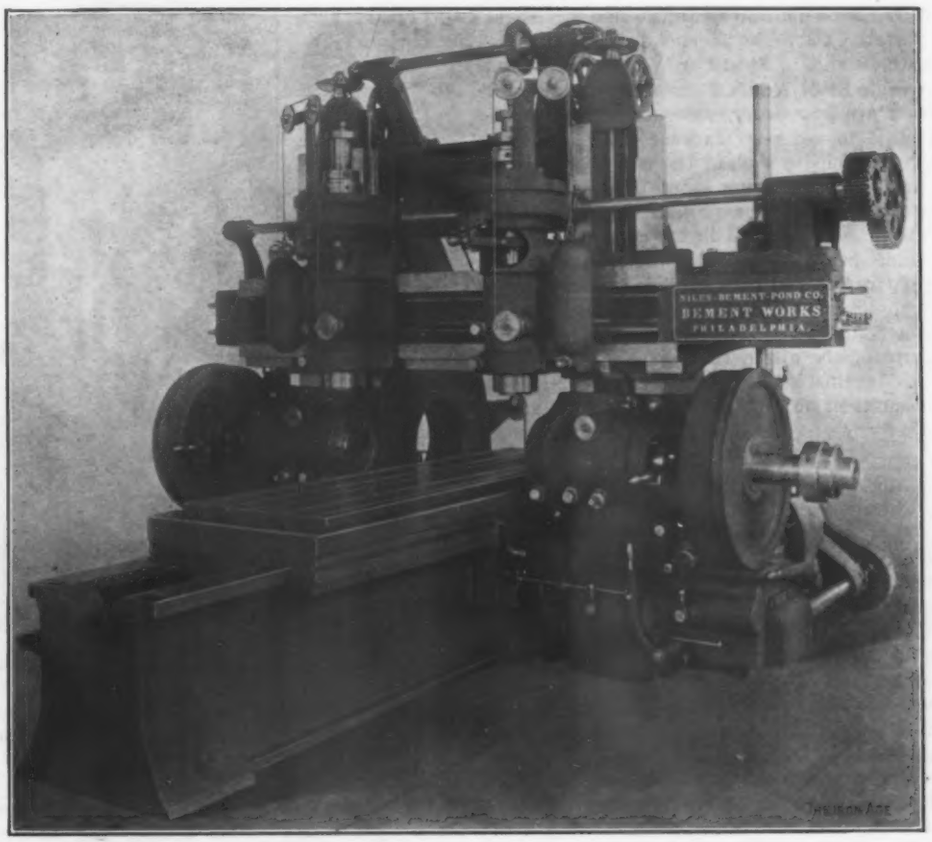
THE IRON AGE

New York, Thursday, May 10, 1906.

The Bement Four-Head Milling Machine

The use of heavy milling machines in manufacturing is becoming more and more general as their superiority over planers for certain classes of service is better appreciated. For instance, in machining pieces where a fine finish is desired, on such parts as locomotive rods, one cut with a milling machine is sufficient, while with a planer two cuts at least would be required and the finish would not be as good. Also, by the use of gang cutters on a milling machine complicated forms can be machined at one cut and in much shorter time than would be possible on a planer.

A four-head milling machine having two vertical and two horizontal spindles is adapted to a much wider range of work than other types of horizontal milling machines.



A Heavy Four-Head Milling Machine, Built by the Bement Works, Philadelphia, of the Niles-Bement-Pond Company.

The vertical spindles can be used to reach down and finish bosses which are difficult to get at while the horizontal spindles are machining the sides of a casting, or the two horizontal spindles can be used for driving an arbor on which gang cutters are placed, or one of the vertical spindles can be used to finish the end of a piece at one setting, the head being fed along the cross rail. In fact, the varieties of ways in which the various spindles can be used is almost endless.

The machine illustrated is built by the Bement Works, Philadelphia, of the Niles-Bement-Pond Company, and is intended for work 36 inches wide and 36 inches high, the distance between the housings being 43 inches. The table is 35 inches wide and 8 feet long, but the machine can be built to mill any desired length. The horizontal spindles have eight speeds, a maximum diameter of 8 inches and a traverse of 10 inches. The greatest distance from the center of the horizontal spindles to the table is 30½ inches and the least distance 4 inches. The greatest distance between the ends of the horizontal spindles is 43 inches. The maximum diameter of the vertical spindles is 6 inches, the traverse 8 inches and the number of speeds 16. The greatest distance from the ends of the vertical spindles to the table is 42 inches and the least distance 8 inches.

W. A. Robinson and A. C. Dean of Buffalo, N. Y., have invented and patented a water wheel for the development of power without sluiceways, which they claim will permit of power manufacturing plants being constructed along any stream having a current of over one mile an hour, without diverting any portion of the stream. The idea is to develop power by a movable wheel which can be raised from the water or lowered, somewhat in the manner in which a "jackknife" bridge is raised and lowered. In the water the blades or paddles of the wheel are in a vertical position. Being self-feathering they present a full surface to the current while on the side of the wheel that is moving down stream, feathering automatically as they approach the side of the wheel that is moving against the current, so as to cut the water with the least possible resistance. Where the stream is deep enough the power wheels can be immersed one above the other, if desired. The inventors claim that these water wheels could be placed all along the Niagara River, between Lake Erie and the falls, where the current is swiftest, and a vast amount of power developed without lowering the flow over the falls or in any way injuring their scenic beauty; also that much power could be developed from wheels located in the rapids of the lower gorge below the falls and the whirlpool.

The Norton Producer Gas Power Plant.

Producer gas power has recently been adopted by the Norton Emery Wheel Company for extending its present steam plant at Worcester, Mass. The horizontal double acting heavy duty type gas engine built by the Westinghouse Machine Company, Pittsburgh, Pa., has been adopted, with Loomis-Pettibone producers using bituminous coal. The new gas engine will be 500 brake horse-power rated capacity, directly connected to a Westinghouse 250 volt 300 kw. generator running at a speed of 150 revolutions per minute. This unit will operate in parallel with two belted steam units, the entire plant supplying current to the various motor drives in the factory and also for lighting.

The Westinghouse engine will be of the tandem cylinder single crank style, water jacketed throughout. Pistons will be supported practically clear from the cylinder by front, middle and rear crossheads. All valves are located directly in the cylinder body in a vertical line; inlet at the top and exhaust at the bottom. A sensitive governing system of the relay type places each inlet valve independently under the direct control of the governor, by which arrangement extremely close speed regulation is secured. Similar engines of this type are now operating the Warren & Jamestown Railway Interurban system at Warren, Pa.; at the Carnegie Technical Schools, Pittsburgh, Pa.; at the Standard Steel Car Works, Butler, Pa., and at the Carnegie Steel Works, Pittsburgh. Engines of 3500 horse-power are now under construction for the latter plant, designed to use blast furnace gas.

At the Norton Company's plant the gas used will be a mixture of two gases averaging about 125 British thermal units per cubic foot. The producer process is intermittent, water gas being made during a short run, and "blast" or "air" being made while the producers are being blown preparatory to the succeeding water gas run. After a thorough cleansing in wet and dry scrubbers, the gas is sent to a holder of sufficient capacity to secure a thorough mixture of the alternating charges of the two different gases. In this case a 20,000 cubic foot holder will be used—sufficient to run the engine for about 25 minutes.

The controlling interest in the Engineering Agency, Incorporated, Chicago, which was organized in 1893 by Frederick A. Peckham, has been purchased by A. G. Frost, and at a recent directors' meeting Mr. Frost was elected president. R. D. Smith, vice-president, and P. W. Herring, secretary and treasurer, retain their offices as heretofore. The agency has a branch office in Pittsburgh and contemplates the early opening of offices in New York and Denver. The head of the mining department of one of the prominent Western mining schools, it is stated, will probably take hold of the company's Western business. The agency advises that there has been an unprecedented growth in the securing of competent engineering assistants through this bureau by the better grade of employers, an average of 250 per month being placed through the Chicago office, while the Pittsburgh branch, which has only been running about three months, will place during the present month between 75 and 100 men. Through the J. G. White Company the agency has sent a party of 20 men to the Philippines on the Government railroad work there. Men are also being sent to Mexico, South America and the Far West.

Operating with trolley current at 2200 volts, 25 cycles, a series single phase electric railway system between Atlanta and Marietta, Ga., the first alternating current line in the Southern States, was recently put into service. The line, which is of standard gauge, is about 15 miles long, and is supplied with power from the hydraulic station of the Atlanta Water & Electric Power Company, located 18 miles from Atlanta, transmission along the feeders being at 22,000 volts, with three-phase current. Each of the two sections of the road is served by two transformer substations, these stations being a little more than 3 miles apart. The major part of the line has a 0000 trolley wire with cross suspension, which forms the entire low potential distributing system.

A New Buffalo Cross Compound Engine.

The design of steam engines, and particularly those of the small high speed type, has settled down to approximate uniformity, as may be judged from a comparison of all standard makes. It is true of all machines that after the experimental stage has been passed the knowledge gained results in the adoption of certain standard main features. In this sense then there is little new in the vertical cross compound marine type steam engine illustrated. Its builder, the Buffalo Forge Company, Buffalo, N. Y., simply claims to have embodied in it the recognized features of good steam engine construction, with refinement in some of the minor parts which make for greater convenience in operating and somewhat better than ordinary economy. Principal among these is the type of piston valve used.

The accompanying half-tone, Fig. 1, shows a general view of the engine mounted on a subbase adapted to receive an electric generator, with the copper casing removed to expose the working parts. The supports for the cylinders and guides in the rear are of cast iron, and in the front are steel stanchions to give the necessary stiffness. The casing which incloses the moving parts between the cylinder and bed plate is easily removed, making these parts readily accessible for any adjustments that may be necessary. Fig. 2 shows longitudinal and cross sectional elevations which make clear the general construction, and Fig. 3 gives details of the piston valve.

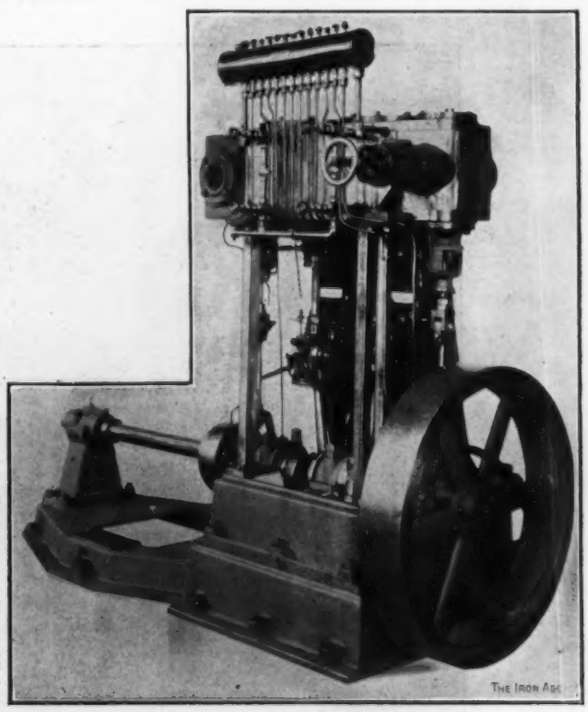


Fig. 1.—A New 9 and 14 x 8 Inch Vertical Cross Compound Marine Type Steam Engine, Built by the Buffalo Forge Company, Buffalo, N. Y.

The engine illustrated has 9 and 14 x 8 inch cylinders and is fitted with the Buffalo automatic high speed inertia governor. It has a one-piece crank shaft, piston rods of 0.25 carbon steel, and removable babbitt linings for all the principal bearing surfaces. The connecting rods are made of forged steel, and where they rock on the cross head pin are formed with forked ends, while the crank ends of the rods are of the locomotive strap and wedge type. The forged steel crank shaft is carried in ring oiling bearings and is counterweighted in a manner designed to reduce the vibration to a minimum. The two cylinders, valve chests, bottom head plates, stuffing boxes and supports, to which the frame rods are fastened, are all cast in one piece.

The piston valves which serve the two cylinders are entirely new in their design. They are of the Buffalo balanced type and carry snap rings that are always free

and form a true circle when in the chamber and in tension. The rings, shown at *a*, are turned to a diameter of 6⅛ inches before cutting. One-eighth of an inch is then cut out and the ring is sprung together, after which it is turned down to a diameter of 6 inches to make a perfect fit in the bore of the valve chamber. A ⅛-inch groove is cut in the cap, as shown at *b*, to allow steam to enter to the inside of the snap ring and press it out against the walls of the cylinder. In this manner the piston is made always tight against the cylinder by the automatic action of the steam, the wear being compensated for by the expanding of the floating snap ring out against the cylinder. The pressure of the snap ring against the cylinder is about ½ pound per circumferential inch of the snap ring. These pistons have been tested with steam at 130 pounds pressure and found not to leak, a point which is important when the best steam consumption is sought.

The engine when carrying full load is guaranteed to consume not more than 24 pounds of steam per indicated horse-power when running noncondensing, and not more than 20 pounds when running condensing, with a boiler pressure of 125 pounds. The extension base is supplied when

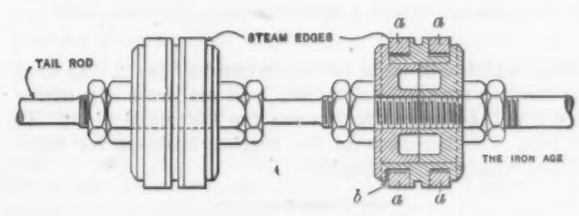


Fig. 3.—The New Piston Valve in the Buffalo Engine.

the engine is to be used for the direct driving of a generator, for which service it is particularly adapted on account of the close speed regulation. The engine is somewhat more expensive than the company's horizontal tandem compound engine, but on account of the small amount of floor space required and the compactness of the design it is recommended for many uses on shipboard or wherever floor space is an important consideration.

Oil Transformed to Water.—Our readers are asked for the solution of an incident of a fire at Worcester, Mass., which occurred during the last cold spell. The machine shop of E. W. Whitmore was subjected to great heat from adjacent rooms in the same building, though the fire did not actually reach the shop. Great volumes of water were poured into the room, the temperature being so low that ice formed over everything. The fire was in the afternoon. In the late forenoon six oil cans had been freshly filled, three with machine oil, three with lard oil. The next day, when an examination was made of the premises, the cans were found to contain not a drop of oil, but were filled with water which had little even of an oily odor. There may be some better explanation of the phenomenon than that the great heat caused the oil to evaporate, and the steam from the water condensed to take its place. This is remarkable from the fact that

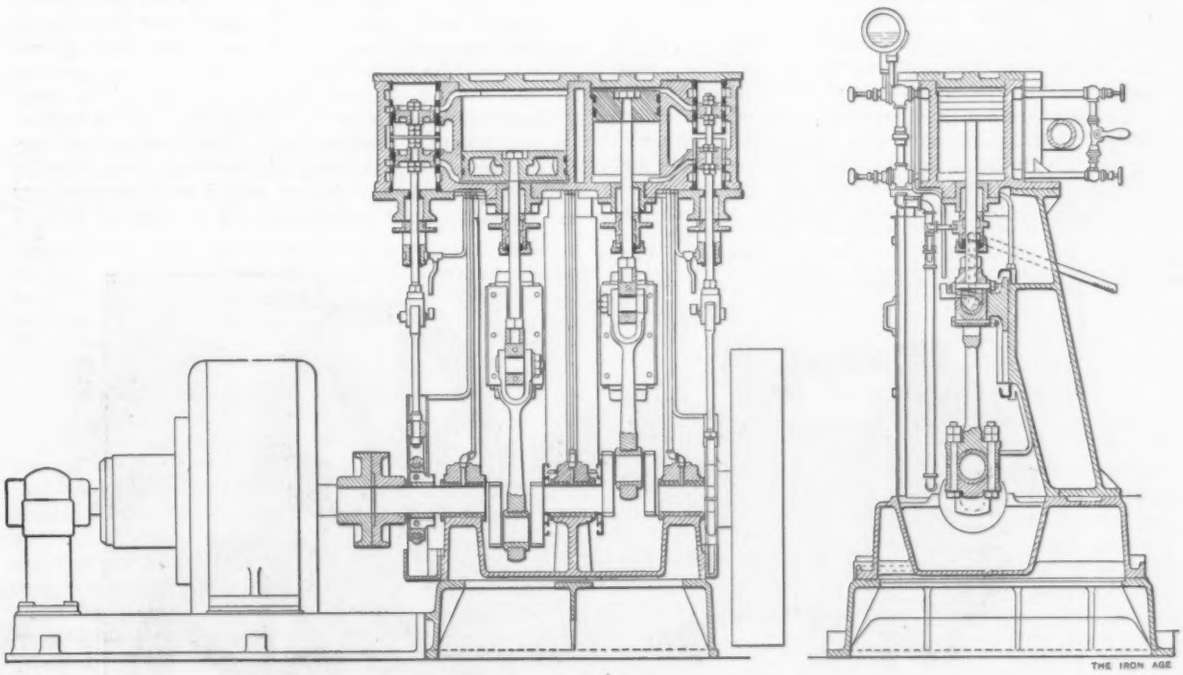


Fig. 2.—Longitudinal and Cross Sectional Elevation of the New Buffalo Vertical Cross Compound Engine.

the cans themselves were uninjured, and also from the exceedingly small orifice through which the water must have entered to fill them to their limit of capacity.

The Atha Steel Castings Company.—This company, which was recently organized to take over the business of Benjamin Atha & Co., Newark, N. J., and which has become a subsidiary of the Security Investment Company of Pittsburgh, of which George Westinghouse is president, is making extensive additions to its plant. There are in course of construction at the plant six bays, to be built of steel, with concrete side walls and roofs, each approximately 50 feet wide and 209 feet long. The first bay will contain three 25-ton open hearth furnaces, which are to be served with a Wellman charging machine and an electric traveling crane; the second, third and fourth bays will be used for molding and pouring; the fifth for cleaning and chipping, and the sixth for a machine shop for rough finishing. The foundry bays will be equipped with 40-ton traveling cranes and the machine shop with a 50-ton crane. The company is also erecting a producer building which will contain six producers, and there will also be a pattern storage building. These structures will also be of steel and concrete throughout. The foundry, including the old section, will be equipped with sand conveyors and other modern machinery, so that the production can be carried on with all the advantages possible. The present output of the plant is about 1500 tons of finished castings a month. The company expects to be able to increase it to 3000 tons when the additions are completed. The specialty of Benjamin Atha & Co. was railroad castings and castings for electrical purposes, and the new company expects to follow in the same line. A large proportion of its output, at least, will in all probability be used by other branches of the Westinghouse interests.

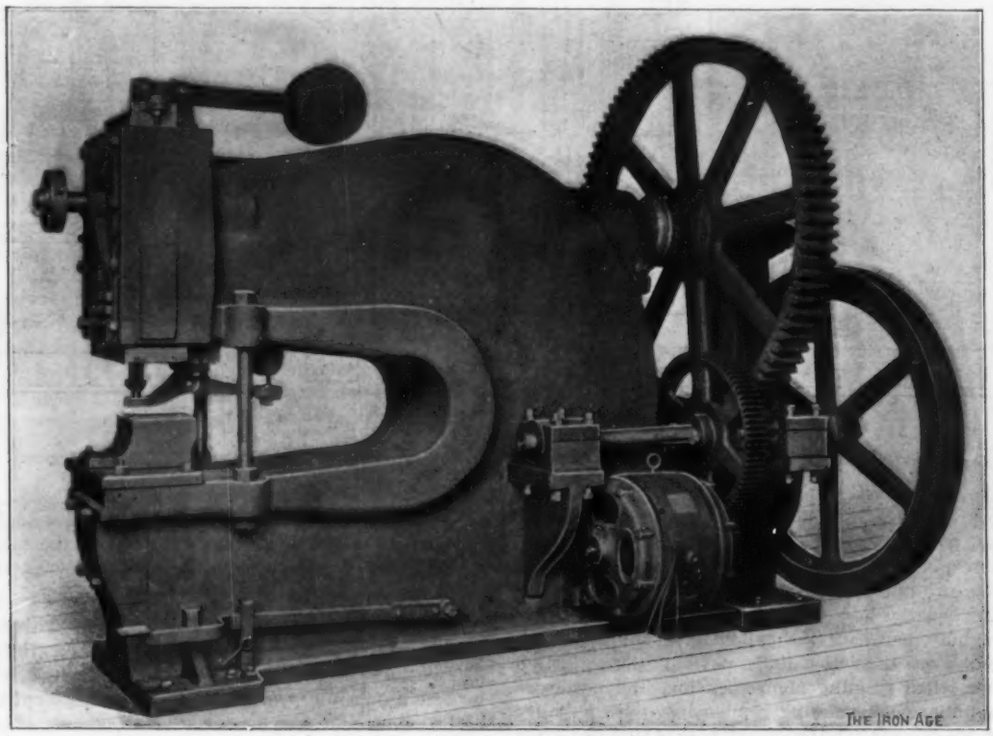
A New Motor Driven Cincinnati Punch and Shear.

A specially compact arrangement of motor drive may be seen on the No. 1 combined punch and shear illustrated herewith, and made by the Cincinnati Punch & Shear Company, Cincinnati, Ohio. It does away with the back base used on belted machines, and the motor is so placed that it takes up little if any additional floor space. The feet of the motor are bolted directly to the side of the frame, and the bearings for the intermediate fly wheel shaft are supported on brackets cast on the frame. The motor pinion and the intermediate gear are steel, and the large wheel is hydraulic iron, machine molded.

Compactness and strength are specially to be noted, since the machine, though of heavy construction, occupies a minimum space and is so closely connected. A patent positive adjustable automatic stop enables the operator to easily set the clutch so that the head will positively and automatically come to rest at any point of the stroke, which makes possible exact center punching with no risk of wrong location of the hole. A new feature is the patent sliding clutch on the large gear shaft, which gives greater strength, as the shaft at the clutch section is square and as large across the flats as these shafts usually are in diameter. The hole through the clutch is also square, so that the clutch bears on the whole four sides of the shaft. There are no keyways in either the clutch or the shaft, no feathers and no springs. The device is easier shifted than the ordinary clutch, and there is nothing to wear out. A special combination punch block is used for regular standard work in the position as shown, and with the block reversed and the lower jaw removed, structural or overhanging work may be punched in the flange and web. The sliding head is counterbalanced, and is driven by a heavy eccentric shaft engaging the pendulum which operates the head. The punch slide is made long to decrease the angularity of the pendulum and stiffen the construction. The head stops automatically at the top of its stroke, and the raising point of the slide may be varied.

As a punch the machine has a capacity for punching a 1½-inch hole through a 1-inch plate. When equipped with a shearing attachment it will cut plates up to ⅞ inch thick, flat bars up to 8 x 1 inches, round bars up to 2 inches in diameter, or 6 x 6 x ⅝ inch angles. The throat depth is 48 inches.

The machine occupies a floor space of about 3 x 12 feet, and the net weight of the machine, including the motor, is 30,000 pounds. A 10 horse-power direct current 220-volt motor drives the punch at a rate of about 25 strokes per minute.



A New Motor Drive on a No. 1 Combined Punch and Shear, Built by the Cincinnati Punch & Shear Company, Cincinnati, Ohio.

The Cambria Forge Company.—This company has been incorporated at Johnstown, Pa., with a capital of $150,000 by John H. Walter, R. P. Smith and Curtis G. Campbell. A number of other capitalists of Johnstown are interested. A plant will be built for the manufacture of general drop forgings, giving particular attention to making automobile and bicycle parts, car forgings and other specialties of fine quality. Johnstown was selected as the place for the new plant on account of its cheap fuel, abundance of labor and proximity to mills making the best grades of forging steels. The company has purchased the entire equipment of the Hussy Drop Forging Company, Cleveland, and has added to it enough new hammers and presses to double the capacity of the old plant, which will be in full operation by May 1. As soon as the new plant at Johnstown is in readiness the equipment will be moved to it from the Cleveland plant. P. Hussy, who has been in the forging business for some years, will be superintendent.

One of the municipal enterprises of Montreal is an asphalt plant, with a capacity of 1000 square yards per day. It is used both for repairs and for new work, the former being now nearly all in charge of the city officials. Experiments are being made with different brands of asphalt, with the idea of determining the one best suited to conditions of climate, &c. When, due to wet or cold weather, asphalting is suspended, the force is employed in grinding in a mill the old asphalt taken from the streets under repair, in preparation for the construction of coal tar composition sidewalks. The average cost of the asphalting done by this plant during its first two years of operation, including all items connected with the work, was $1.22 per square yard. The total cost of the plant, including tools, repairs and the buildings which have been erected in the corporation yard, amounted to $22,881.

The Machine Tool Builders' Meeting.

The spring meeting of the National Machine Tool Builders' Association at Atlantic City, May 1 and 2, accomplished much important business before adjournment early in the evening of the second day. In addition to the advance in prices of 5 per cent. made by the planer and shaper sections, as noted in *The Iron Age* of last week, the lathe builders, after protracted meetings, voted an advance of 5 per cent. on both domestic and foreign orders. This advance, as in the case of those on planers and shapers, is on the resale or consumers' price. In common with builders of most other classes of machine tools the lathe manufacturers made their original advance of 5 per cent. soon after the meeting at New York in December. The present advance makes the total of increase 10 per cent., which was advocated by a minority of the association in December.

The upright drill report advancing prices, as stated in *The Iron Age* a fortnight ago, was received and accepted by the association. This advance is in the nature of a readjustment of prices as well as an increase, for the meeting of the upright drill men at Chicago, which resulted in the new prices, served to bring about a more uniform schedule among the manufacturers. In certain instances the increase in price was as high as 7 per cent., while in some special cases the advance was even higher. No report was received by the convention from the manufacturers of radial drills, milling machines, boring mills and sensitive drills. It is quite possible that advances will be announced later in one or more of these lines.

The association gave considerable time to the consideration of the matter of increasing the discounts and protection to dealers. The National Supply and Machinery Dealers' Association has advocated an increase in discount from 10 per cent. to at least 12½ per cent. The sense of the Atlantic City meeting was that a fixed discount cannot be fairly applied to all classes of machine tools. It was argued and agreed to that the discount on an inexpensive machine would naturally be greater than that on a very large planer or boring mill. The dealer is compelled to go to very much greater expenditure of time and money to sell a cheap tool than a large tool, when the ratio of profit is taken into consideration. Consequently it was voted to refer the entire matter of discounts and protection to the individual sections of the association, each to settle the question for itself. The lathe section took up this matter and voted to lay it on the table, which means that nothing more will be done with it for the present.

Another interesting and important topic of discussion was the question of an effective cost system which would apply to the manufacture of machine tools. A committee was appointed to make a thorough investigation of the subject of ascertaining the true cost of machine tools. This committee consists of F. A. Geier, Cincinnati Milling Machine Company, Cincinnati; E. P. Bullard, Jr., Bullard Machine Tool Company, Bridgeport, Conn., and C. H. Alvord, Hendey Machine Company, Torrington, Conn. It has been the experience among machine tool manufacturers that in certain shops there is no adequate cost system and the manufacturers have no true knowledge of what their product costs them. The result sometimes has been that the amount of profit which these manufacturers believe they are making is very greatly exaggerated. They erroneously figure their cost so low that they sell at a price in the market which those competitors who know the true cost of their product cannot meet and make a profit. The result has been a conflict of interests. The purpose of the association in making an investigation of the subject is really along the line of a campaign of education.

The following new members were admitted: Niles-Bement-Pond Company, New York; Cincinnati Machine Tool Company, Cincinnati; W. F. & John Barnes Company, Rockford, Ill.; Rockford Machine Tool Company, Rockford, Ill.; Mechanics' Machine Company, Rockford, Ill., and Dwight Slate Machine Company, Hartford, Conn.

It was voted to hold the next meeting in New York City in October, and the matter of date and headquarters was left to the Executive Committee. A vote of thanks was received from the ladies who were present in Atlantic City during the meeting for the entertainment extended to them by the members, and it was voted that the invitation be tendered to the ladies who may wish to accompany the members to be present during the next convention, and in case a banquet is held that they be admitted with members.

The meeting of the association was one of unusual importance, not only in the work accomplished and the questions discussed, but in the evidences of increasing interest which were manifested. It will be noted that the new members admitted are especially significant. The entrance of the Niles-Bement-Pond Company will undoubtedly have a wide influence in extending the prestige of the association. It is quite probable that others of the great machine tool interests, which have hitherto held aloof from the association, will have become members before another year has passed by. It has been thoroughly demonstrated that the association has worked to the great advantage of all machine tool builders, especially, of course, of the members; that the association has now passed every experimental stage, and that it only needs the active co-operation as members of a comparatively few other machine tool manufacturers to make its influence for good complete. The association has requested *The Iron Age* to extend to all machine tool manufacturers an invitation to membership.

The Economy of Good Engineering.

The economic value of good engineering is strongly emphasized by an instance which has recently been given publicity. The B. F. Sturtevant Company, Boston, Mass., submitted in competition with other blower manufacturers an estimate for certain electric fans of its own manufacture, and according to its usual practice carefully designed them, together with the piping system, in order to accomplish the desired results with the least expenditure of power. To this end large, slow running fans were planned, and the relative air velocities at all points were carefully regulated.

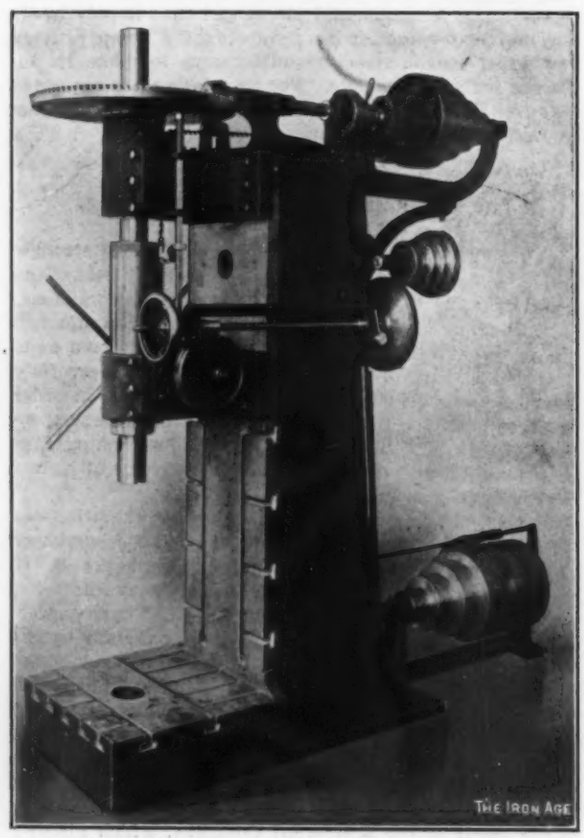
Owing to the large size of the apparatus, the price was fully $500 the highest, but to impress upon the purchaser the economic value of such an equipment the B. F. Sturtevant Company enforced its logic by guaranteeing that the power required would not exceed 15 horse-power, and agreed to forfeit $100 per horse-power for any excess above this, provided it received a bonus of $50 per horse-power for any reduction below the amount specified. The lower priced arrangement submitted by its competitors was at first stated by them to require 50 horse-power, a statement which, with evident purpose, was subsequently reduced to 25 horse-power. The Sturtevant apparatus was purchased under the conditions of the guarantee, and to the credit of the Sturtevant Company, which allowed sufficient margin in its calculations to insure the receipt of a bonus, the trial test indicated an actual power expenditure of only 10.5 horse-power, thus calling for a bonus of $225. This was cheerfully paid by the purchasers with the satisfaction of knowing that, although the first cost was greater than might have been incurred if a competitor's design had been accepted, the power was 58 per cent. less—that is to say, an excess of $725 had been paid, but a constant saving of 14.5 horse-power was insured. Upon a basis of $50 per horse-power per year the excess payment will be made good by the saving in one year's operating expense. While such cases are presented in many lines of manufacture and installation they are peculiarly characteristic of blower practice, where the manufacturer is sometimes tempted to secure the order at a low price by making the apparatus as small as possible, regardless of the excessive power that may be required to drive it.

It is said that enough coal has been discovered in the Island of Batan, one of the Philippine group, to supply the Philippine Government, together with the army and navy, with 200,000 tons annually for 348 years. Favorable results have followed the use of this coal on some of the inter-island transports.

The Hoefer Vertical Boring and Drilling Machine.

In the class with what have previously been referred to in these columns as single purpose machines may be placed the vertical boring and drilling machine herewith illustrated, which has been especially designed for boring engine cylinders. It is adapted for heavy, rapid and accurate work, owing to its rigid construction, and is built by the Hoefer Mfg. Company, Freeport, Ill.

The driving shaft is located at the rear of the base and carries a four-step cone pulley and tight and loose driven pulleys. The cone pulley belts to the four-step cone immediately above, at the rear of the top of the column. This latter pulley is loose on its shaft and drives the latter through back gears having two reductions. Just in front of the back gears is a smaller four-step cone pulley from which the drive for the feed of the spindle is obtained. The forward end of this same shaft carries



A Special Vertical Boring and Drilling Machine, Built by the Hoefer Mfg. Company, Freeport, Ill.

a bevel pinion meshing with a large bevel gear which is feathered to the spindle. To take the transmission thrust a roller is provided supporting the under face of the large bevel gear. These bevel gears have a ratio of 6 to 1 and the back gears a ratio of 4 to 1, giving a total reduction of 24 to 1 from the cone pulley to the spindle.

The feed is obtained from the small cone pulley just referred to, which is belted to another four-step cone supported on a bracket at the side of the column. The gear connected with this latter cone pulley meshes another on a long spindle, mounted so that it may be tilted at its outer end. This is for the purpose of disengaging the worm on the forward end from a worm wheel connecting with a pinion which meshes a rock on the spindle sleeve for raising and lowering the spindle. On the same shaft with the worm wheel and at the opposite side of the machine is a four-armed lever used for rapidly withdrawing the tool from the work. When this is used the worm on the tiltable shaft is lifted by means of a handle on the outer end sufficiently to disengage it. The hand wheel, also on the outer end of this shaft, is used for hand feeding when the power feed is disengaged. The power feed may be automatically stopped at any point by a depth gauge.

The crucible steel spindle is 3 7-16 inches in diameter and has a No. 5 Morse taper hole in the end. Its range of feed is 14½ inches. The sleeve is supplied with a cut steel rack and is counterbalanced by a weight in the interior of the column. In the hole in the base of the machine may be inserted stationary and rotating sleeves for supporting the end of the boring bar. These are not shown in the engraving. The rotating sleeve is provided with a cap to prevent borings from entering the bearing. Both the base and the face of the column are planed and provided with T slots for holding work. The greatest distance from the spindle to the base is 28½ inches, the distance from the face of the column to the center of the spindle is 13 inches, the table is 22 x 24 inches, the necessary floor space is 24 x 32 inches, the total hight of the machine 90 inches and the net weight 4000 pounds.

Iron and Steel Production in France in 1905.

The production of pig iron in France in 1905 as recently ascertained is put at 3,077,000 metric tons, the total being divided as follows: Forge, 686,000 tons; foundry, 670,000 tons; Bessemer, 157,000 tons; Thomas, 1,531,000 tons; special, 33,000 tons. The 1905 production was about 2½ per cent. in excess of that for 1904, which was 2,999,787 tons. The *Journal Officiel* gives the production of Bessemer and open hearth ingots in France in 1905 as 2,110,000 tons, and of castings as 26,000 tons. The ingot production in 1904 was 2,080,354 tons. The production of steel by the crucible process and by minor processes for 1905 is not stated. In 1904 the total under these heads was 26,785 tons. Some attempt is made to classify the finished iron and steel production, but it is unsatisfactory. Under "mild steel" are these items: Rails, 283,000 tons, against 246,339 tons in 1904; merchant steel, including wheel tires, 635,000 tons; sheets, 274,000 tons, against 299,376 tons in 1904; forgings, 37,000 tons, and castings, 26,000 tons—a total of 1,255,000 tons. Under "wrought iron and steel" are two items: merchant iron and steel, 635,000 tons, and sheets, 77,000 tons, the total being 712,000 tons.

The Pennsylvania Railroad Company has opened its new ore dock at South Buffalo, across the canal from the Buffalo & Susquehanna Iron Company's plant, and the first cargo of ore was unloaded there last week. The storage pit is 1000 feet long, 240 feet wide and 28 feet deep, having a capacity of 300,000 tons, and is equipped with two Brown unloaders and a large Hulett unloader. The capacity of the Brown machines is 5 tons each and of the Hulett 10 tons. The pit idea for ore storage is a new one and the Pennsylvania Company's plant differs in this respect from any along the lakes. It is modern and complete in every particular, and it is expected that 1,000,000 tons of ore will be handled at this plant during the season.

Investigations on the effect of clay on the tensile strength of Portland cement mortar have shown surprising results, the clay in some cases having increased the strength and in others materially reduced it. In a 1 to 1 mortar no addition of clay produced a gain, while the losses with various mixtures amounted to a maximum of 50 pounds in an original strength of 680 pounds. With 1 to 2 mortar, having a strength of 595 pounds, 3 per cent. of clay in the sand caused a drop to 550 pounds, while 16 per cent. was accompanied by a rise to 615 pounds. With 1 to 3 mortar the tensile strength increased from 375 pounds with clean sand to 555 pounds with 16 per cent. clay, but then fell off to 365 pounds with 40 per cent. clay. An increase was experienced with 1 to 4 mortar from 300 pounds with clean sand to 445 pounds with 20 per cent clay. A falling off then ensued, bringing the strength down to 270 pounds with 50 per cent of clay.

New Fox Light Drills.

Sensitive or high speed drills, while not an expensive part of a machine tool equipment, are important, as they offer the most economical way of drilling small holes. The work can be executed more rapidly than on a large machine, and at the same time the danger of breaking drills is practically eliminated. Two styles of light drills built by the Fox Machine Company, Grand Rapids, Mich., are shown in the engravings.

The style A single spindle drill, illustrated in Fig. 1, does not differ greatly from a pattern formerly made, except that it is now furnished with two tables, one of them arranged to swing. Drills of the same type are also made in multi-spindle pattern, with from two to six spindles, inclusive. Among the special features of these drills are that each spindle has independent belt tension adjustment and three independent changes of speed, that the spindle brackets are clamped by a straight pull from the back instead of from the side, so that there is no tendency to spring the spindle out of line, and that the tables are of large size and have a long range of vertical adjustment. On the two, three and four spindle drills the table is counterbalanced by a weight inside the column, and on the five and six spindle machines the verticle adjustment is by means of a worm and screw. All of the spindles drill to the center of a 16½-inch circle on the top bracket, and to the center of a 13½-inch circle on the main column. The vertical adjustment of the spindle bracket is 10 inches, and the movement of the spindle in the head 4 inches. The single spindle drill has a net weight of 275 pounds, and the weight increases proportionately with the number of spindles up to the six spindle machine, which has a net weight of 1035 pounds.

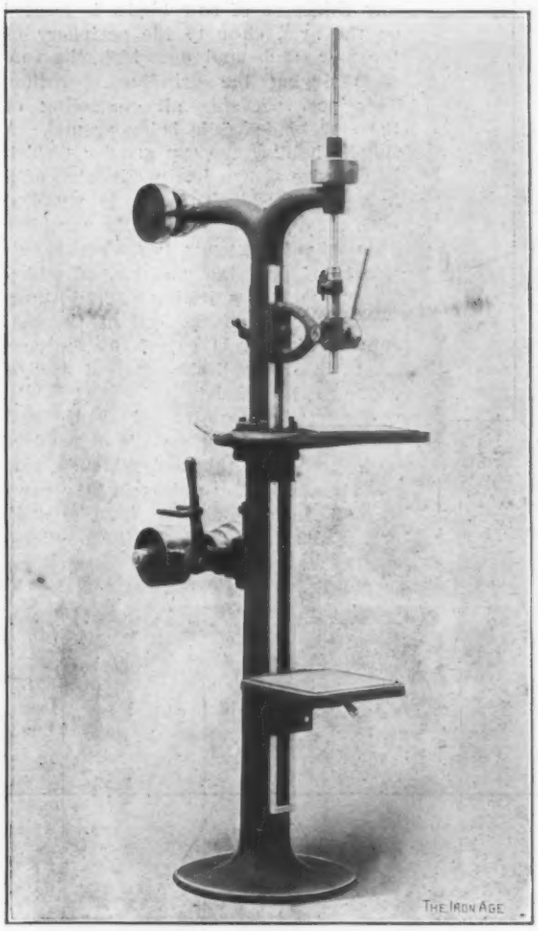


Fig. 1.—The Fox Style A One-Spindle Drill.

The style B single spindle sensitive drill, shown in Fig. 2, is an entirely new machine. The principal features are a very strong one-piece casting, a base 24 inches in diameter, table with 26½-inch vertical adjustment, and an improved type of spindle and spindle bracket construction. There are three changes of speed. The spindle is counterbalanced by a quick acting spring. The spindle bracket is clamped by a straight pull from the back, as in the style A machine, instead of from the side. Extra long removable bushings are used on the upper cone bearing. An adjustable collar on the spindle sleeve provides an accurate depth gauge. The table has an oil groove around the edge and may be conveniently locked in position by an eccentric clamping lever which gives it a quick and positive action. The countershaft is a novel style of construction, the pulleys revolving on a fixed shaft instead of in the customary way, the tight pulleys and the cone pulleys being in one piece. Under proper conditions a hole ½ inch in diameter can be drilled at the rate of 1 inch per minute in cast iron. The machine drills to the center of a 16½-inch circle. The vertical adjustment of the spindle bracket is 10 inches and its feeding travel 4 inches. The hight of the machine to the idler pulleys is 5 feet 4 inches and the net weight is 267 pounds.

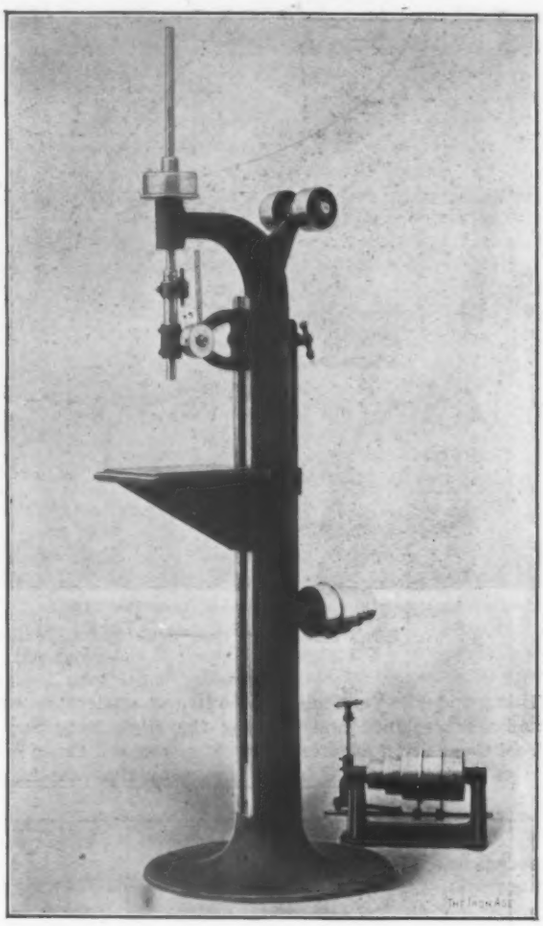
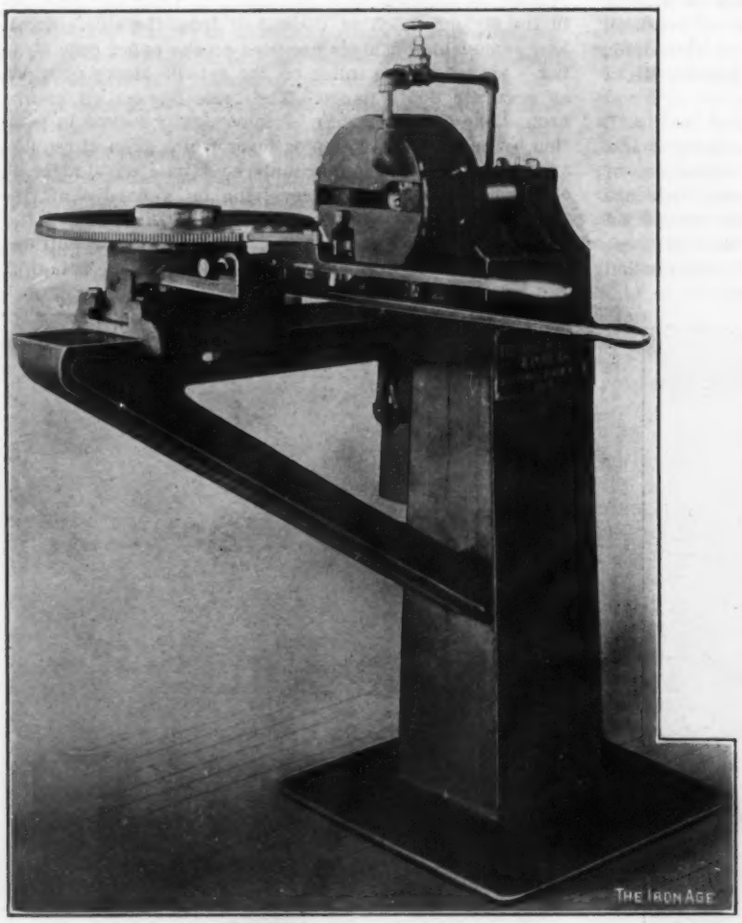


Fig. 2.—The Fox Style B One-Spindle Drill.

Concerning the heating of boiler feed, "Experimental Philosophy," published about 1725, gives the results of observation up to that date in an interesting way: "It had been found of benefit to feed the boiler with warm water coming from the top of the piston rather than cold water, which would too much check the boiling and cause more fire to be needful. But after the engine had been placed some years some persons concerned about an engine observing that the injected water as it came out of the induction pipe was scalding hot, when the water coming from the top of the piston was but just lukewarm, thought it would be of great advantage to feed from the eduction or injected water, and accordingly did it, which gave a stroke or two of advantage to the engine."

The Tindel High Duty Saw Grinding Machine.

A new type of power wet grinder for sharpening the inserted teeth of high duty saws is illustrated herewith.



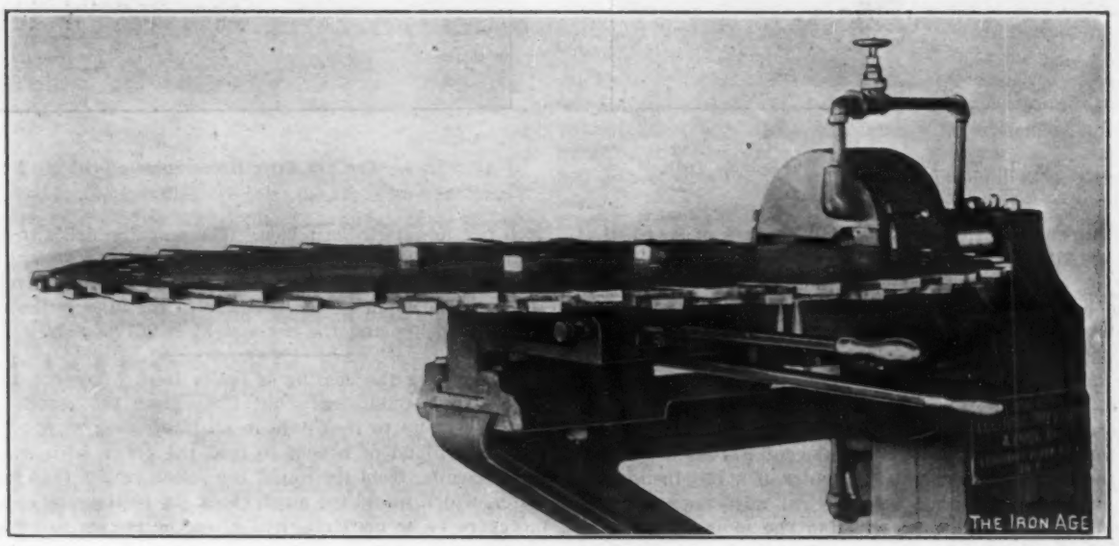
The Tindel High Duty Saw Grinding Machine.

This grinder is particularly effective at moderate speeds and was designed and built by the High Duty Saw & Tool Company, Eddystone, Pa. The frame of the grinder is of cast iron, the arm being cast on the base in one piece, so as to insure perfect rigidity. An adjustable saddle moves along the arm of th tool so as to enable the grinder to be used on saws of different diameters, and after being placed in the position desired may be fastened rigidly to the arm by lock nuts. A short slide operates in grooves along this saddle. This slide is surmounted by a disk having a raised center, on which the saw to be sharpened is placed and held in position by suitable bolts. On the periphery of the disk are cut a number of ratchet teeth, by which, through the action of a pawl on the hand lever, a rotary motion is given the saw blade, the extent of the movement being adjusted by two set screws.

The in and out motion of the slide is controlled by another lever, which is also adjustable, so that the same depth and angle may be cut on every tooth in the blade and allowances for the reduction in size of the grinding wheel may be made. A post with set screw and lock nut, so that it may be adjusted to any thickness of saw blade, is located on the arm, close to the periphery of the saw blade and on which the saw rests during the grinding operation. This post prevents all chattering of the saw blade while being ground. A spindle holding the cup grinder (which in the size shown has a diameter of 9 inches with 2-inch face), is supplied with a pulley for driving the machine. This spindle extends beyond the outside bearing of the machine, on which it carries a pulley driving a small rotary pump, located on the end of the machine, which, from a tank at the rear of the base, supplies a constant flow of water to the grinder.

Perfect uniformity of depth and angle of the cutting tools is claimed to be insured with this tool, which is now being made in three sizes to take saws up to 30 inches diameter, from 30 to 48 inches and from 48 to 72 inches diameter. The one illustrated is of the intermediate size and weighs complete between 700 and 800 pounds.

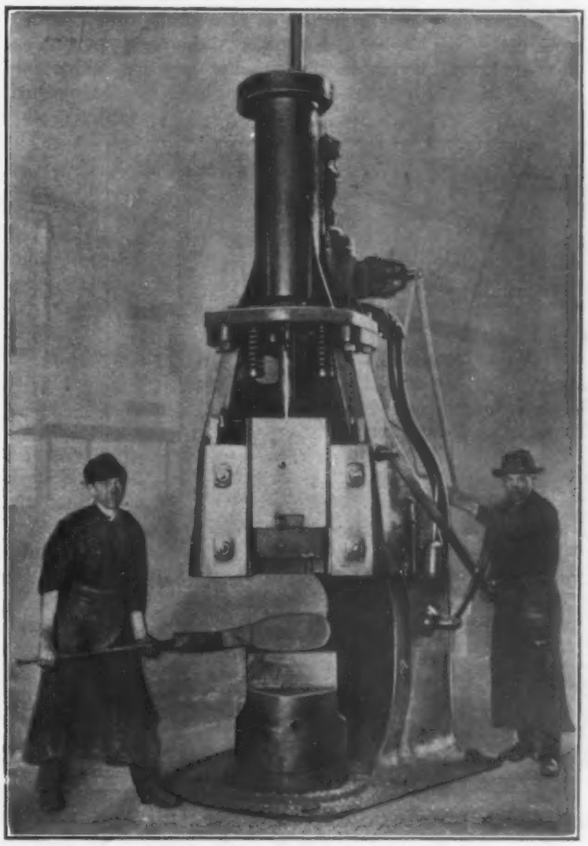
The Stewart Iron Works Company, Cincinnati, Ohio, has leased a plot of ground opposite its works, which is being developed into a small park for public purposes. The entire park will be inclosed with various patterns of the company's ornamental iron fencing, a magnificent entrance gate 15 feet wide being one of the features. The park proper will have distributed throughout ornamental iron flower vases, lawn settees, &c., and will make in fact a practical exhibit of the company's products.



The Tindel High Duty Saw Grinding Machine with a Saw Blade Mounted.

The Bell New Improved Steam Hammer.

Steam hammers are a specialty of the David Bell Engineering Works, Buffalo, N. Y. The illustration shows a new improved single frame standard guide pattern having reinforced guides and a stiffened column in which it has been the special object to increase the strength and durability. The hammer is double acting, taking steam or compressed air at the top and bottom of the stroke, and is designed to give a maximum force of blow, but under perfect control, so that it may be easy to vary and regulate the force and position of the hammer. Continuously sustained automatic operation is possible with sensitive regulation by a throttle value, which can also be connected to a foot treadle, saving the service of a helper when working the hammer automatically. The valve motion is simple, having few working parts, and is not connected except by sliding contact with the hammer head, hence is free from shock or jar of the blow.



An 1100-Pound Steam Hammer, Built by the David Bell Engineering Works, Buffalo, N. Y., for the International Railway Company of the Same City.

The only attention required is claimed to be proper lubricating.

The casting forming the main frame is made from a pattern without cores except the column core, the column being of box section. The bed plate is cast in one piece, solid with the frame, having heavy ribs below the floor line running lengthwise and heavy reinforcement around the die block opening. The latest improvement to the hammer consists of a reinforced guide, which makes the main casting at the point to which the lower end of slides are bolted fully 50 per cent. stronger and heavier than heretofore. The strength has also been increased by adding a vertical flange on the cross web, tying the lower ends of the slide faces together in the main casting. This overcomes a weak point in this type of hammer and strengthens the point where the most strain comes. The column has been stiffened by adding to the pattern and casting solid on the column of the main frame a heavy band or web extending from around the bottom of the slides down each side of the column to the bed plate and joining at that point the heavy ring around the die block opening. This adds to the resistance to shearing at any point in the column.

The cylinder casting is in one piece with the piston and throttle valve chests, and has extra heavy flanges top and bottom, which are reinforced by vertical ribs. The main working valve is of the balanced piston type, working in a removable bushing.

The hammer head is set at an angle in the main frame casting to allow drawing and finishing work either way of the dies without encountering the column. The head is finished from the solid, having V grooves which work in adjustable V slides. The heavy slides are through bolted to the main frame, with spring washers on bolts, and are fitted with taper gibs extending their length arranged for independent adjustment. The piston rod is fitted in a taper hole in the head, the jam of which gives the rear hold, but a safety pin is added to give warning if the rod becomes loose.

The die block is in two pieces, and the cap above the bed plate can be easily removed when more space is requird for special shape work, upsetting, &c. The lower die can then be put into dovetail slot in the lower die block. The die block is entirely independent of the bed plate, so that no strain from hammering is put upon the bed plate. One set of plain forging dies are regularly furnished of special open hearth steel.

When necessary to examine the cylinder or renew the packing rings on the piston, the latter can be raised above the top of the cylinder without disconnecting it from the hammer head by removing the buffer springs and the piston rod gland, which is in halves. The spiral springs are fastened to the under side of the reinforced cylinder flange to cushion the up stroke and prevent injury from careless handling, there being still clearance between the top of the piston and the cylinder cover when these springs are compressed solid.

The foot treadle attachment is furnished as an extra, and is useful for certain classes of work on hammers up to and including 850 pounds falling weight. The hammers are rated by the actual weight of the falling parts, which does not take into consideration the added force of the blow from the steam or air pressure on top of the piston. Seven standard sizes are built, the weight of the falling parts of these being, respectively, 350, 600, 850, 1100, 1250, 1600 and 2000 pounds. The total weights range from 7200 pounds for the smallest to 36,000 pounds for the largest. The smallest has a 5½ x 8 inch steam cylinder, occupies a space of 3 feet 11 inches by 2 feet 6 inches by 8 feet 2 inches high, and the largest has a 13 x 38 inch steam cylinder, and occupies 7 feet 3 inches by 4 feet 10 inches by 15 feet 5 inches high.

Fuel Testing in Illinois.—The committee having the direction of the fuel testing works to be conducted at the University of Illinois at Urbana, Ill., is composed of representatives from various State engineering and commercial organizations as follows: H. Foster Bain, Urbana, Ill., State Geological Survey; A. Bement, Chicago, Western Society of Engineers; Edwin H. Cheney, Chicago, Building Managers' Association of Chicago; F. H. Clark, Chicago, Western Railway Club; Adolph Mueller, Decatur, Ill., Illinois Manufacturers' Association; Carl Scholz, Chicago, Illinois Coal Operators' Association; A. B. Schroeder, Springfield, Ill., State Electric Light Association; William L. Abbott, Chicago, Board of Trustees, University of Illinois; Prof. L. P. Breckenridge, Urbana, Ill., Engineering Experiment Station, University of Illinois.

To find the power of a steam turbine installed in a ship a new device consists in measuring the torsional deflection of the shaft, after having calibrated it for this purpose. The measurements in order to be of more than merely approximate value have to be very delicate. They are recorded by automatically registering electrical devices, which show the instantaneous momentary angular variations in position of two portions of the shaft at known distances apart. This apparatus is installed on the Carmania, as well as on other well-known turbine steamers.

A Large Tod Engine Casting.

The accompanying illustration shows one of the 18 bed plates recently cast by the William Tod Company, Youngstown, Ohio, for the four pairs of twin tandem compound reversing engines which that company has under construction for the Bethlehem Steel Company. Each of these bed plates is 34 feet 6 inches long, 10 feet 4 inches wide, 5 feet 1¼ inches thick at the rear end and weighs 75 tons. The company's foundry has been very successful in making these enormous castings. Each of the engines for which these castings are intended will have two high pressure cylinders 40 inches in diameter and two low pressure cylinders 66 inches in diameter, all of 54-inch stroke, and each engine will weigh about 1,000,000 pounds.

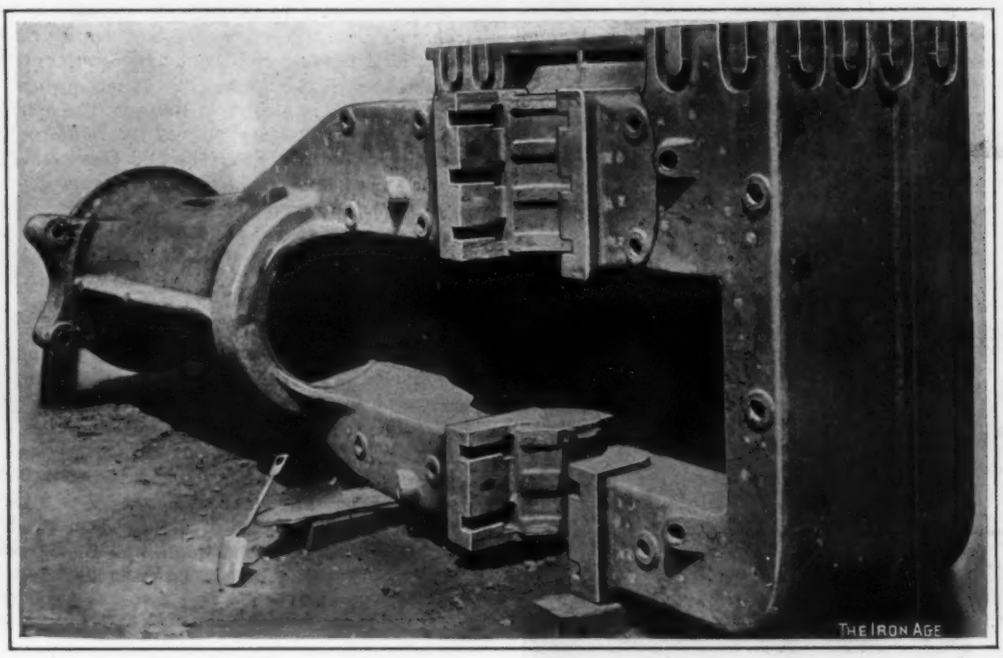
The Tennessee Coal, Iron & Railroad Company Improvements.

As the result of the recent inspection tour of the new owners of the Tennessee Coal, Iron & Railroad Company in the Birmingham district and the recent meetings of the Executive Committee held in New York, a programme of improvements has been mapped out that will be undertaken at once. This will look to an increase in steel and pig iron capacity and much of the expenditures already authorized will be made on work that it is expected can be finished in the next twelve months. It will be carried on in such a way as will cause the least interruption to the operation of existing plant and will result in additions to both blast furnace and steel works' outputs at intervals through the year. To-day the open hearth furnaces at the Ensley plant are not producing steel enough for the blooming mill and rail mill. In turn the blast furnaces at Ensley cannot supply the wants of the open hearth department, the result being that cold pig metal must be shipped from other furnaces. Going back still further, an increase in blast furnace output is dependent on securing greater efficiency in coke making and on increasing the supply of ore.

In the raw material departments expenditures to be made at once will provide for a large increase in coal washing equipment and for the getting out of a larger output from the company's brown ore mines. In addition to the new washing plants, coal crushers will be installed and the coal will be so prepared for the by-product coke ovens that more and better coke will be produced.

At the Ensley group of furnaces the No. 5 furnace, which has been under reconstruction, will be ready to blow in in about 60 days and will take its place in the class of the new No. 6 furnace that has made so good a record, both in output and economy of production. The plans for the rebuilding of the other four furnaces in the group will then be carried out. No. 4 will be taken in hand first, then No. 3, No. 2 and No. 1, in turn, only one furnace being out at a time. New boilers will be installed, some addition will be made to the blowing capacity and the bin system will be extended, so that sufficient ore can be carried at the furnaces to insure a steady supply independent of the occasional interruptions to iron mining due to heavy rains or to the peculiar labor conditions obtaining in the South.

Whatever the decision as to extensive new construction to be undertaken ultimately at the steel plant at Ensley, the plan to be carried out at once includes the building of several additional open hearth furnaces, the moving of the gas producer plant a sufficient distance from the open hearth house to give some relief to the workmen from the heat, that under Alabama temperatures has been very trying in the summer months, and other changes that will yield a considerably increased output.



A Large Tod Engine Casting.

While to-day the steel product is sufficient to permit of rolling 16,000 to 17,000 tons of rails a month, after the company's bar mill has been served and shipments made on billet contracts, it is expected that the rail mill will have an output of 30,000 tons a month by the spring of 1907. Eventually this will be carried to 40,000 tons a month, or more.

At the annual meeting of the stockholders of the Tennessee Company, held at Tracy City, Tenn., on May 1, 1906, Anthony N. Brady was elected a director to fill the vacancy caused by the resignation of Don H. Bacon. The directors' meeting, which was first announced for May 15, will probably be held at the offices of the company in the Trinity Building, New York, one week later. By that time it is expected all the detailed estimates of the company's engineers relating to the proposed improvements will be in shape for final action. At this meeting it is probable that a president of the company will be elected. He will be a man experienced in steel works' operation.

The directorate of the company is now made up as follows: Term expires 1909: Anthony N. Brady, Oakleigh Thorne, Leonard T. Beecher, New York; Samuel G. Cooper, Pittsburgh. Term expires 1908: Edward J. Berwind, John W. Gates, George A. Kessler, Grant B. Schley, New York. Term expires 1907: Leonard C. Hanna, Earl W. Oglebay, Cleveland; John A. Topping,

Pittsburgh. The Executive Committee consists of John A. Topping, chairman; John W. Gates, Leonard C. Hanna, Earl W. Oglebay, Grant B. Schley. John A. Topping is chairman of the board of directors; Don H. Bacon is president (retires May 15); Leonard T. Beecher, vice-president; L. Hoover, secretary and treasurer. The offices of the company are now at Birmingham, except that the board room is in New York, in connection with the eastern selling offices of the company, in the Trinity Building, 111 Broadway.

Customs Affairs.

No Duty on Moisture in Ores.

The Board of United States General Appraisers May 3 sustained a claim filed by the Prime-Western Spelter Company, and laid down a rule which is of general interest to handlers of ores. In brief, the board holds that customs officials have no right under the tariff law to make a return which will result in the importer paying a duty on the moisture in the ore, instead of paying assessment on the actual amount of lead in the ore, as in the case at bar. It is obvious that the tribunal's ruling is applicable to all ores.

The official papers in the protest of the spelter company show that the ore was shipped from British Columbia to Kansas City, Mo., where it was examined and assessed for duty at the rate of 1½ cents per pound "on the lead contained therein." There is no question as to the correctness of the classification, but the protest challenges the method adopted in arriving at and determining the amount of lead upon which duty was assessed.

The duty provided for being a per pound one, the weight of the lead in the ore must be ascertained by an assay. As shown by the testimony, the method adopted in this case was to take a sample of the ore in a finely pulverized or powdered condition, which appeared to have been artificially dried and from which, at any rate, all moisture had been eliminated; this sample was weighed and the amount of lead having been ascertained, the percentage of lead to the ore contained in the sample was determined by mathematical calculation.

The two carloads of ore are shown to have contained a large amount of moisture. In one car the gross weight of the ore, including moisture, was 62,050 pounds; this same ore, with the moisture excluded, weighed 60,373 pounds. The ore in the other car, including the moisture, weighed 65,100 pounds, while the same ore, with the moisture excluded, weighed 63,052 pounds. In determining the amount of lead upon which duty should be levied the appraiser applied to the ore in its moist condition the percentage of lead ascertained to be in the sample of dry ore. It is apparent that, by this process, duty will be collected upon a part of the moisture contained in the ore, whereas the law authorizes the collection of duty only upon the lead contained in the ore. In other words, the importer will be required to pay duty on water as well as on lead, or, stated differently, he will be required to pay duty on more lead than was actually contained in the ore, and hence more than he received. This, says the board, is contrary to the fundamental principle of the tariff law, that duties shall be collected only upon the merchandise imported.

General Appraiser Fischer, who writes the decision for the board, says in part:

> There are probably no decided cases in which the exact question presented by this case was considered and no Treasury regulation which, except in a general way, bears upon the question. Article 1276 of the regulations of 1899, which governs the allowance or abatement of duties on account of the absorption of sea water, has no application to a case like the one at bar. That provision of the regulations which, in our judgment, has the most direct bearing upon this case is that contained in the first sentence of article 1275 of the regulations of 1899, which reads: "Duties must be assessed on the actual quantity of the merchandise imported." This is but a restatement of a principle which underlies the administration of the tariff law.
>
> The dutiable merchandise imported in this case was lead, as the duty is not assessed upon the ore but upon the lead contained in the ore, and it is the duty of the liquidating officer to ascertain the amount of lead so contained. This we think he failed to do by the process adopted. We need not point out what process of ascertaining the amount of lead in the ore should be adopted, as it is sufficient to say that it must be some process that will ascertain the actual amount, and will not result in the assessment of duty on more or less lead than was contained in the ore imported.
>
> The protest is sustained and the collector is directed to reliquidate the entry accordingly.

It is likely that the Government will carry this issue into the courts for final adjudication.

The New York Appraiser Resigns.

George W. Whitehead, appraiser of the Port of New York, handed his resignation to the Secretary of the Treasury on Friday, after a service of more than thirty years with the Department. Mr. Whitehead retires for the purpose of engaging in private business, he having been elected to the presidency of a bank at Niagara Falls. In an interview Mr. Whitehead denies all reports of friction and states that the change is merely to benefit his condition.

Duty on Nickel Wire.

Hermann Boker & Co., New York, were defeated on May 7 in the attempt to secure lower duty for nickel wire. The ground for the action of the Board of Appraisers was that the protest failed to go into particulars and was for that reason indefinite. It appears that the merchandise in controversy was nickel wire with an iron or steel core, which was assessed for duty at the rate of 45 per cent. The only claim made by the importers was that the goods are "properly dutiable under the provisions of paragraph 137 of the Tariff Act." The paragraph referred to is a long one and the protest failed to go into particulars. On this account I. F. Fischer, who writes the decision for the board, says the protest must be overruled because of lack of compliance with section 14 of the Customs Administrative Act.

The Philadelphia Foundrymen's Association.

There was a good attendance of both local and out-of-town members at the one hundred and fifty-seventh regular meeting of the Philadelphia Foundrymen's Association, held in that city May 2. Dr. E. E. Brown presided and called the meeting to order at the usual hour. Day Brothers, iron and steel merchants, Second and Willow streets, represented by R. W. Day, were elected to membership in the association. The treasurer, Josiah Thompson, reported a balance amounting to $2,418.72 in the treasury with all bills paid. A subscription of $100 was made by the association to the San Francisco Relief Fund, making a total, together with amounts contributed by members of the association, of $500, subscribed through the Foundrymen's Association.

After some discussion it was decided that the formal invitations of the Philadelphia Foundrymen's Association and the Philadelphia Foundry Foremen's Association to the American Foundrymen's Association and the Associated Foundry Foremen of that body, to meet in convention in Philadelphia in 1907, should be individually extended. The committees of both local organizations are, however, to work in conjunction on all other points pertaining to this matter.

A paper prepared by William Cook, foundry superintendent of the Haines, Jones & Cadbury Company, Norristown, Pa., on the subject of "Education of Apprentices as a Means of Overcoming Floating Labor in the Foundry," was presented and read. Mr. Cook said, in part, that the loss of many thousands of dollars in business by those engaged in the foundry trades is largely due to the inability to obtain competent molders, a condition which under the present condition of business is causing a considerable amount of attention by employers. In some cases it has been impossible to complete contracts on time, while in others the continual delay in deliveries has resulted in the cancellation of orders. The greater portion of this trouble is due to what are termed "hoboes," or "floating molding labor." Mr. Cook's idea as to the means of overcoming this condition is the establishment of a working foundry for the education of apprentices in the art of molding. Such an establishment should be under the direction of the manufacturers, and in charge of competent superintendents; it should be so divided as to take in every branch of the trade, and a

thorough education given to all apprentices. A term of four years is suggested. The product of such an institution should be marketed, and it could, Mr. Cook believes, be made self-supporting in a few years. Such a plan, it is thought, would result in an increased percentage of good mechanics in this branch of the trade, and would eventually drive the "hobo" or floating molder out of existence.

Considerable discussion followed the reading of the paper, and conditions governing the situation in a number of individual plants were brought out. The local Foundry Foremen's Association, it was said, is discussing this subject at length, and it is to be the subject for debate at the next meeting, but as yet no plan has been adopted which would fully meet the needs of the present situation.

Harry D. Harvey, of the Monarch Engineering & Mfg. Company, Baltimore, Md., presented and read an interesting paper on the Steele-Harvey crucible melting furnace for brass foundry practice, using oil or natural gas for fuel. A general discussion following the reading of the paper, particularly in view of the use of the Steele-Harvey furnace for iron and steel practice.

After a vote of thanks to Messrs. Cook and Harvey for their papers the meeting adjourned.

The Pennsylvania Molding Process for Casting Car Wheels.

The Pennsylvania Molding Process Company, Pittsburgh, Pa., has been granted patents covering the United States and Canada for a new design of molding machine for casting car wheels. One of these machines has been installed in the plant of the Pennsylvania Car Wheel Company on Preble avenue, Allegheny, Pa., and is working very satisfactorily. It was designed by W. E. Connelly, general superintendent of the latter company.

The machine occupies a space of about 50 feet square in one end of the plant, the patterns used being all of cast iron, making them practically indestructible, thus doing away entirely with wooden patterns, pattern makers and pattern shop. The plant of the Pennsylvania Car Wheel Company is equipped with three cupolas of 150 tons capacity each, one being of the Whiting make and the other two of the Collier type. The metal is tapped from these cupolas into large ladles holding about 7 tons each and which serve as hot metal reservoirs, the operation of making the wheels being so fast that a constant supply of hot metal is imperative. From these large ladles the metal is poured into two smaller ladles which are picked up by a Sprague electric hoist and taken to the molding machine, two molds being poured from each ladle.

The molds, instead of being rammed by hand in the usual way, are pressed automatically by a presser with cylinders 24 inches in diameter and 10 inches long, the machine exerting a pressure of 95 pounds per square inch. The molds after being pressed by this machine are said to be absolutely perfect and require no patching or slicking with molders' tools, which is necessary by the old method of hand ramming. After leaving the hydraulic press the mold is finished by two men, who put on it a cast iron clamp, after which it is picked up by a Sprague electric hoist and placed on the pouring table, which will accommodate ten molds at one time, this table revolving so that it comes under the ladle holding the metal ready to pour.

After being poured the molds are picked up by an electric hoist and taken to the annealing pits, of which there are 176, of uniform size, each pit accommodating about 20 wheels, where the mold is shaken out over gratings, the sand falling down through these gratings into a conveyor which takes it back to the molding machine, the hot wheels being lowered into these annealing pits, where they are allowed to remain about 144 hours, to allow thorough annealing.

The process is a continuous one and the molding machine at present is turning out about 300 wheels per day. Some improvements will shortly be made to it by which it is expected the machine will turn out at least 350 wheels per day. It is a remarkable fact that no molders are employed about the machine, all work being done by ordinary labor. It is claimed that wheels cast by this machine are more uniform in weight and better meet the rigid requirements of the railroads than car wheels made by the ordinary methods of hand molding. It is the intention of the Pennsylvania Car Wheel Company to add one and possible two more of these molding machines to its plant at a very early date.

The method of handling the sand for this molding machine is unique and permits a considerable saving in labor. The sand is conveyed from the shaking out pit to an elevator and is dropped automatically into a riddler. After being thoroughly riddled it falls into another section of the sand conveyor, where it is tempered by water and is then taken to the molding machine by an overhead conveyor. Results have shown that water tempered sand is much better for use in car wheel molds than when tempered by hand.

A valuable feature of this molding machine is its simplicity of construction, it being adapted for installation in foundries having the usual equipment. The machine is capable of casting any size of wheels, from 12 inches up to 36 inches in diameter, and it is the intention of the Pennsylvania Molding Process Company to build and sell these machines to other car wheel foundries. The members of the Pittsburgh Foundrymen's Association visited this plant on Monday evening, May 7, to see the operation of the machine and were extremely interested in witnessing the rapidity with which car wheels were cast by it. After watching the entire process, which was fully explained by W. E. Connelly, general superintendent, a luncheon was served to the visitors.

San Francisco's Condition and Prospects.

SAN FRANCISCO, April 28, 1906.—This is the tenth day since the earthquake and the beginning of the disastrous fire which has so completely devastated San Francisco. The fire lasted from Wednesday till Saturday and during that time fully two-thirds of the whole city was burned. The district burned, as nearly as can be given, extended from Van Ness avenue and Seventeenth street on the west and Dolores street on the south to the bay. On the south in the business district it ran a waving line between Bryant and Brannan street out to Seventh. Any one with a good map can see the extent of the area burned. Within this area the appraiser's store and the custom house (which is in it), a branch brick post office on Jackson street and the Monadnock Building on Market street escaped, one might say, unscathed. The Ferry Building requires repairs, but is otherwise intact, while the new Fairmount Hotel on Nob Hill is only blackened by smoke. The Merchant's Exchange on California street is in a similar plight, but otherwise uninjured. The entrances and clearances of vessels are posted there every day.

The banks are all opening up offices in the Western addition, but it will be a couple of weeks or perhaps three before they can open the vaults that contain their coin and securities. Meanwhile they will not pay the full amount of depositors' claims; after that time it is expected that as far as they are concerned everything will go on as usual. Between United States bonds and coin they have about $100,000,000 available.

The losses by the fire are placed conservatively at about $250,000,000, those by the earthquake being largely nominal. The amount of insurance on the property is variously estimated at $175,000,000 to $200,000,000—certainly not less than the former—while San Francisco's realty is valued at $500,000,000, in round numbers. Land, money, United States bonds and insurance make up an available capital of $800,000,000, which is a pretty good one with which to start in business again.

Since the fire, rush orders have gone East for goods of all descriptions, ranging from 1 car to 100 each. There are 200 firms already that have ordered in the aggregate 800 cars and in a few days that will be doubled. This is the amount that has gone through the hands of routing agents only. Orders for building material and structural steel have been especially heavy. As the greater part of the new city will be built of steel, brick, stone and

concrete, San Francisco for the next three years will be the best customer that the eastern mills will have.

A great deal of the business of the city will go temporarily to Oakland, which is really a part of this city and has grown with San Francisco's growth. Scores of San Francisco's business people have already taken temporary headquarters there; some have headquarters on both sides of the bay, the most of them, however, in San Francisco. Here Fillmore street is at present the great headquarters of the business of San Francisco. Stores are at a premium, and the streets crossing it from east to west are filling up with offices. Before the fire this was a business street in the wealthy residence section of the city. Many business men have their offices temporarily in their own homes. Of course, this is all preparatory to the rebuilding of the business quarters of the city, and after this is done Fillmore street will quiet down again, although it will never be as quiet as of yore.

With the exception of the Fulton Iron Works, the Risdon Iron Works and the Union Iron Works, all the great manufacturing establishments of San Francisco were destroyed. The Union Iron Works has resumed with 800 men, the Risdon with 500 and the Fulton with 200. These will be added to as soon as the men can be got together. J. O. L.

Two Gallons of Gasoline.

Very few owners of automobiles are interested in endurance tests. They never expect their machines to travel 500 or 1000 miles without stopping, nor do they contemplate this method of crossing the Continent. Freak runs do not constitute any part of their itinerary; also few care whether their motors are capable of 50 or 70 miles an hour. Most owners are satisfied to go a reasonable distance at a speed that will not endanger the life of any one. Even the scorcher, after a little, will complacently examine a machine about to overtake him and permit it to pass without any twinges of conscience; he has not forgotten his cunning; he has only resumed his place as a sane man among men.

But all—manufacturer and owner, rich and moderately poor—are concerned in such a test as that of last Saturday. The experiment was a run over a route from New York through Stamford, Bridgeport and New Haven. The object was to determine how far an automobile could travel over ordinary country roads with a consumption of 2 gallons of gasoline. The test had nothing to do with endurance or speed, and the comparatively small and light car had the same chance of success as the most powerful. There were 71 machines entered in the contest, and of these 65 started. They varied in size from the little single cylinder buckboard to the high powered touring car and represented almost every pattern of automobile. A system of handicapping was adopted in order to place all the machines as nearly as possible on the same footing. Each was supplied with 2 gallons of gasoline at the start. There was no limit regarding time—distance was the sole object.

The best performance was by a four-cylinder runabout of 12 horse-power, weighing 1500 pounds. On one charge of fuel it ran 87 miles, or a short distance beyond New Haven. Another car of the same make and precisely the same pattern made only 58 miles.

Fifteen hundred pounds moved 87 miles on 2 gallons of gasoline means 66 ton-miles at a cost of 36 cents for fuel. This is a ton-mile for ½ cent. Taking into consideration the fact that the roads were unusually heavy part of the way—it rained during the trial—the result is remarkable and compares most favorably with the cost of haulage on the railroad with its perfect track.

In a trial of this character the "personal equation" appears in very large proportions. Of two cars identically the same and operated under like conditions one travels over 40 per cent. further than the other. The explanation is to be found in the difference in the skill and judgment of the two drivers, and a parallel case is found in the engineers in control of two locomotives of the same pattern. One will get more work out of his engine with less fuel than the other. A trial of this kind cannot be won under a continuous use of the same power; the rate must be changed almost constantly in order to take advantage of variations in the road and grade. Running the automobile to its full capacity all the time, or at a snail's pace, never would have produced the result. It is probable that if the trial were repeated with the two drivers exchanging places success would follow the one who made the best showing last Saturday.

Universal Pipe at the Central Foundry Company's Plants.

For several months the Central Foundry Company has been engaged in making improvements and extensions to its plants at Newark, N. J., and Bessemer, Ala. An interesting feature is the use of the Universal pipe made by the company for carrying the water supply, compressed air and the live and exhaust steam from the central plant to the different places where water, air and steam are required. In the accompanying illustration we

Universal Pipe at the Central Foundry Company's Plants.

show a trench in which the Universal pipe is laid and from which it can be seen that the pipe conforms to a considerable curve, showing the flexibility of the iron to iron joint made in this cast iron pipe. The pipe at the right hand side of the trench carries steam at a pressure of 125 pounds, and the larger pipe beside it brings the exhaust steam back from the blowing engines to the heaters used in the establishment. The next pipe on the left is a 6-inch Universal pipe, conveying air at 90 pounds pressure. The small pipe at the left is a 2-inch water supply pipe working under a pressure of 70 pounds.

The company has used the same character of piping for various other purposes. The Universal pipe, in providing a flexible joint and being made of cast iron, has been found not only by the company in the equipment of its own plants, but by many of its customers, to be admirably adapted for such purposes, particularly when it is laid in the ground, where the exposure effects a quick destruction of pipe less well calculated to withstand it.

Oakland Headquarters Established.—We are advised by wire that the address of the general purchasing agent of the Southern Pacific Railroad Company has been established at 305 San Pablo avenue, Oakland, Cal.

The Mechanical Engineers' Convention.

Last Friday evening brought to its close one of the most delightful meetings of the American Society of Mechanical Engineers that has ever been held. The place of meeting—Chattanooga, Tenn.—was especially favorable for many reasons, but particularly because of its scenic beauty and historic interest, which made up for what it might have lacked in engineering and industrial attractions, such as have been offered by most of the cities previously visited. It has been the custom at the mid-year meetings to devote less time to the professional sessions than is usual at the annual meetings in New York and spend more time in excursions to points of interest. This was true of this meeting more than ever. Perfect weather made the desire to be out of doors almost irresistible, which largely explains the one regretable feature of the meeting, that the excellent papers presented were not more fully discussed. If the ladies were consulted they would probably declare that it was the most enjoyable meeting they ever attended, and it is a question if their male escorts would not concur. Certainly the local committee, of which Newell Sanders was chairman, has every cause to feel the sincerity of the appreciation manifested for its endeavors to make the meeting one of pleasure and profit.

The opening session of the fifty-third meeting, held Tuesday evening in the ballroom of the Masonic Temple, was reported in the last issue, but the time of going to press made it impossible to cover the later proceedings and excursions.

SECOND SESSION.

Following the usual practice, the business of the meeting was disposed of at the first professional session, held Wednesday morning in the Masonic Temple. An interesting report from the architect of the new Engineering Building, dated April 26, was read by the secretary, giving the present condition of work on the building. A full description of this building, which was presented by Andrew Carnegie to the American Society of Mechanical Engineers, the American Institute of Electrical Engineers, the American Institute of Mining Engineers and the Engineers' Club, was given in *The Iron Age* of December 14, 1905. The secretary also read a letter from the Jamestown Exposition Company, inviting the society to hold its next summer meeting at Norfolk, Va., during the exposition which will commemorate the three hundredth anniversary of the first permanent English settlement in America. Two amendments to the constitution were presented, one concerning an honorary secretary, which it is considered will be desirable, since the resignation of Prof. F. R. Hutton as secretary, announced in the issue of April 5, and the other concerning the maintenance of a standing Research Committee. In accordance with the constitution and by-laws these amendments cannot be acted upon until the next annual meeting following their presentation.

Report of the Committee on Standard Machine Screws.

The report of the Committee on Standard Proportions for Machine Screws was included with the printed papers prepared for the meeting. This committee consisted of Wilfred Lewis, chairman; Charles C. Tyler, Horace K. Jones, John Riddell, George R. Stetson and George M. Bond, and based its report on the conclusions reached in joint meeting with representatives of the screw manufacturers, including Charles Glover, president the Corbin Screw Corporation, New Britain, Conn.; Benjamin Thurston, general superintendent American Screw Company, Providence, R. I., and the Worcester Machine Screw Company, and E. O. Goss, treasurer the Scovill Mfg. Company, Waterbury, Conn. At this meeting John Riddell, a member of the committee, was represented by J. F. Madgett, assistant superintendent the General Electric Company.

The recommendations concerned certain diameters, pitches and limits for standard machine screws, and the best practical methods for establishing and maintaining such standard sizes. In detail the report covers form of thread, diameters, number of threads per inch, standard reference thread gauges, basic, and for screws and taps, working gauges for screws and taps, limits of variation measured in the angle of the thread, limits of variation in external diameter, limits of variation in the pitch of the thread, screws and taps, and proportions of the heads. The report was discussed by L. D. Burlingame and G. A. Gulowsen. From the criticisms raised and the absence of others who could speak authoritatively on the subject it was deemed advisable to defer action on the report until the fall meeting, and a motion was adopted to that effect without further oral discussion.

Report of Committee Co-operating on Locomotive Tests.

Th report of the committee appointed to co-operate with the Pennsylvania Railroad system in conducting tests of locomotives at the Louisiana Purchase Exposition was printed and in the hands of the members before the meeting. Being somewhat difficult to present in abstract, its discussion was proceeded with directly. The members of the committee were W. F. M. Goff, Purdue University; Edwin M. Herr, the Westinghouse Air Brake Company, and J. E. Sague, the American Locomotive Company. The Advisory Committee also included representatives of the American Railway Master Mechanics' Association and other individual engineers distinguished in the field. The report consisted chiefly of brief abstracts of a volume published by the Pennsylvania Railway System, entitled "Locomotive Tests and Exhibits, Pennsylvania Railway System, Louisiana Purchase Exposition."

Eight locomotives were tested, four being designed for freight and four for passenger service. The report covered the tests and their results, with a summary of conclusions dealing with boiler performance, the engine and the locomotive as a whole. Abstracts of the summary follow:

Boiler Performance.—When forced to maximum power the large boilers delivered as much steam per unit area of heating surface as the small ones. At maximum power a majority of the boilers tested delivered 12 or more pounds of steam per square foot of heating surface per hour; two delivered more than 14 pounds, and one 16.3 pounds. These values in terms of boiler horse-power per square foot of heating surface are 0.34, 0.40 and 0.47, respectively. The quality of steam delivered under constant conditions of operation is high, varying between the limits of 98.3 per cent. and 99 per cent. The evaporative efficiency is generally maximum when the power delivered is least. Most of the boilers tested evaporated between 10 and 12 pounds of water per pound of dry coal. The efficiency falls as the rate of evaporation increases. When the power developed is greatest its value commonly lies between 6 and 8 pounds.

With reference to grate area, the results prove that the furnace losses due to excess air are not increased by increasing the area. In general, the boilers for which the ratio of grate surface to heating surface is largest are those of greatest capacity. The loss of heat through imperfect combustion is in most cases small.

Relatively large fire box heating surface appears to give no advantage either with reference to capacity or efficiency.

The Engine.—The indicated horse-power of the modern simple freight locomotive tested may be as great as 1000 or 1100; that of a modern compound passenger locomotive may exceed 1600 horse-power. The maximum indicated horse-power per square foot of grate surface lies, for the freight locomotives, between the limits of 31.2 and 21.1; for passenger locomotives, between 33.5 and 28.1. The steam consumption per indicated horse-power hour necessarily depends upon the conditions of speed and cut off. For the simple freight locomotives tested the average minimum is 23.7. The consumption when developing maximum power is 23.8, and when under those conditions, which proved to be the least efficient, 29. The compound locomotives tested, using saturated steam, consumed from 18.6 to 27 pounds of steam per indicated horse-power hour. Aided by a superheater, the minimum consumption is reduced to 16.6 pounds. In general the steam consumption of simple locomotives decreases with increase of speed, while that of the compound locomotive increases, from which it appears that the relative advantages to be derived from the use of the compound diminish as the speed is increased.

The Locomotive as a Whole.—The percentage of the cylinder power which appears as a stress in the draw bar diminishes with increase of speed. The loss of power between the draw bar and the cylinder is greatly affected by the character of the lubricant. The substitution of grease for oil upon axles and crank pins increases the machine friction from 75 to 100 per cent. The coal consumption per dynamometer horse-power hour for the simple freight locomotives tested is, at low speeds, be-

tween 3.5 and 4.5 pounds, and at the highest speeds it increased to more than 5 pounds. The same for the compound freight locomotives, for low speeds, is between 2 and 3.7 pounds, and at the higher speed it increases from 3.2 to 3.6 pounds. The same for the four compound passenger locomotives tested varies from 2.2 to more than 5 pounds per hour, and the consumption increases rapidly as the speed is increased. A comparison of the performance of the compound freight locomotives with that of the simple freight locomotives is very favorable to the compounds. For a given amount of power at the draw bar the poorest compound shows a saving in coal over the best simple which will average above 10 per cent., while the best compound shows a saving over the poorest simple which is not far from 40 per cent. It should be remembered, however, that the conditions of the tests are all favorable to the compound. It is a fact of more than ordinary significance that a steam locomotive is capable of delivering a horse-power at the draw bar upon the consumption of but a trifle more than 2 pounds of coal per hour, which gives the locomotives high rank as a steam power plant.

Discussing the paper, E. G. Bailey gave it as his opinion that approximate analyses of samples of the coal should have been included in the reports, and outlined the care which is necessary in selecting samples to make them thoroughly representative.

The first professional paper given was entitled:

"Effect of a Blow,"

the authors being Alexander W. Moseley and John Lord Bacon, both of Chicago. The paper proposed a means of measuring the effect of a blow of a power or steam hammer to obtain a more useful rating than the ordinary one based on the weight of the moving parts, inasmuch as there are so many other considerations affecting the force of the blow. The scheme suggested involves the use of plugs of standard size and material; these to be subjected to the blow of the machine tested and their deformation accurately measured. By calibrating exactly similar plugs in a testing machine, the amount of foot pounds necessary to produce a given deformation may be obtained, and from curves plotted the foot pounds corresponding to any deformation may be read off directly. Figures in the paper give such plotted curves for two plugs cut from a coppered Bessemer steel rod. The tests recorded were made in the strength of materials' laboratory and the forge shop of Lewis Institute.

The paper passed without discussion.

The next paper presented,

"A History of the Introduction of a System of Shop Management,"

by James M. Dodge, Philadelphia, was originally presented at the New York reunion of the society in February, 1906. It recounts the experience of three years since the introduction of the system of shop management which was developed by Fred. W. Taylor, the president of the society. The author explained the considerations which led the Link-Belt Engineering Company, Nicetown, Philadelphia, of which he is president, to apply the system and outlined the results obtained. The first step was the adoption of high speed steel tools, made by the Taylor-White process. The increased work put upon the machines made it necessary to improve the machine tool equipment and desirable to employ electric drives. It was found that where a 50 horse-power engine had formerly operated the shop, it now required over 150 horse-power. The increased production introduced other complications. The systems which were thought before to be excellent proved inadequate; such as the store, accounting and shipping systems and the system of routing work. These needed reorganization to fit the new conditions. To straighten out the difficulties Mr. Taylor was called upon, and under his direction the work in the various departments was systematized. One of the cardinal features of the Taylor system is the distribution of responsibility. It has the effect of relieving the bosses or heads of departments from detail work, giving them more time to consider developments and extensions and future improvements. It allows the individual workman to work to his best advantage, his duties are more narrowly defined and by intelligent co-operation loss of time and mental strain are eliminated.

At the time of its original presentation the paper was extensively discussed, principally by asking Mr. Taylor, who was present, for information concerning the applicability of the system to the fields in which the individuals were most interested. No further oral discussion was given, other than an expression of appreciation of the importance of the paper, by Gus Henning.

The paper which excited the most comment and seemed to be considered the most important paper presented at this meeting, and one of the most important ever submitted to the society, was the one on

"Collapsing Pressures of Bessemer Lap Welded Tubes,"

which was printed in abstract in the last issue of *The Iron Age*. It was presented by the author, Prof. Reid T. Stewart, professor of mechanical engineering in the Western University, Allegheny, Pa. Unfortunately there was a misprint in one of the formulæ contained in the paper, which was repeated in our last issue. This is in formula A, and another misprint occurred in formula B. The correct forms of both formulæ are as follows:

$$P = 1000 \left(1 - \sqrt{1 - 1600 \frac{t^2}{d^2}}\right) \quad \text{(A)}$$

$$P = 86{,}670 \frac{t}{d} - 1386 \quad \text{(B)}$$

The discussions of the paper were mainly testimonials as to its value and appreciation of the careful manner in which the investigation was conducted. The society is to be congratulated in obtaining so important a paper, and thanks are due the National Tube Company, at whose instigation the research was made, for allowing the valuable data and information thus obtained to be given to the public.

"A Low Resistance Thermo-Electric Pyrometer and Compensator,"

was the subject of the next paper, which was presented by Prof. William H. Bristol, Hoboken, N. J. The demonstrations of the apparatus, which were given by the author, were of special interest. The paper will be given in abstract in next week's issue of *The Iron Age*. The members were invited to ask questions, and at the close of the meeting those interested had an opportunity to examine it more closely. The author explained its parts to some length, and in answer to a question described the manner in which the instrument is calibrated on the basis of the known melting points of various metals.

The last paper of the morning had for its subject

"A New Liquid Measuring Apparatus,"

the author being George B. Willcox, Saginaw, Mich., in whose absence the paper was read in abstract by the secretary. This apparatus was originally designed to automatically measure brine flowing from a salt well into a salt works, and was later modified in detail and adapted to the automatic measuring and recording of the amount of feed water supplied to boilers. In portable form the device has proved of value in evaporative tests, as it does away with the uncertainties and hard work of weighing by the usual tank and scale method. The apparatus is more strictly a weighing rather than a metering device, and consists of two tanks placed one above the other. the upper or receiving tank stores the liquid and automatically delivers it at intervals as required to the lower tank, where it is weighed. The lower or weighing tank delivers the unit charge intermittently at intervals between deliveries varying with the rate of supply. Quoting from the paper the operation of the apparatus is as follows:

"Liquid accumulates in the upper tank until it overflows a stand pipe located in the upper tank, and spills into the tank below. After a small quantity of overflow has accumulated in the lower tank, the stored liquid in the upper tank is suddenly emptied into the lower tank. Further supply, instead of accumulating in the upper tank as before, flows along its bottom and drops into the lower.

"The liquid in the lower tank automatically discharges when a unit charge has accumulated, and simultaneously the outlet from the upper tank to the lower tank closes, preventing entrance of liquid into the lower tank while the weighed charge is escaping from it."

By means of photographs and sectional views the general appearance, construction and action of the apparatus are made clear. It is claimed for the apparatus

that it eliminates constant errors of graduation present in many water meters, and that its operation is not appreciably affected by air in the liquid, or by changes in temperature, head or quantity of discharge of liquid being weighed, and clogging by dirt is not liable to occur. These advantages are due to the fact that no discharge valve is used in the weighing tank, avoiding the possibility of leakage, and to the reliability of the counterbalancing weight employed—namely, a liquid column of fixed weight. The author stated that numerous trials under actual use as a feed water weigher showed a maximum error after four months of constant service of less than one-quarter of 1 per cent., and also that a temperature fluctuation of 10 degrees causes no appreciable error in operation. The error that would naturally be produced by increased volume incident to increased temperature is small, and even this small error is practically offset by the expansion or contraction of the weighing tank as the temperature rises or falls.

Discussing the paper, Prof. D. S. Jacobus questioned the accuracy of one-quarter of 1 per cent., and desired to know whether it applies to various speeds—that is, with the apparatus operated at one-quarter, one-half and full capacity—for example. W. T. Donnelly believed that the apparatus is one likely to appeal to boiler manufacturers as an excellent device for use in connection with boiler tests.

WEDNESDAY EXCURSION.

The printed programme prepared for the meeting was departed from in large measure. It was originally intended to have four professional sessions, Wednesday morning and evening and Thursday morning and evening, but it was found possible to crowd all of the papers into the Wednesday and Thursday morning sessions. The excursion scheduled for Wednesday afternoon was deferred until the following afternoon, and the Thursday afternoon excursion was taken Wednesday. At 2 o'clock the members and their guests assembled and were conveyed by trolley to the foot of the inclined railway leading to the top of Lookout Mountain. The trip up the inclined railway was probably a sensation to many, and certainly to those who had never before experienced it, it was indeed a sensation to view the surrounding country from the summit. Lookout Mountain stands about 2000 feet above Chattanooga, and from what is known as The Point, commands a view of the Tennessee River valley. On a clear day points in six different States may be seen from this outlook, and on a plateau just below one gazes upon the scene of the famous battle above the clouds. The Government has converted this part of the mountain into a park, called Point Park, and numerous tablets record the events of history and mark the scenes of their enactment.

THE THIRD SESSION.

The closing session of the meeting was held Thursday morning at 9.30 o'clock in the Masonic Temple. The first paper of the morning was one of peculiar local interest and dealt with

"The Improvement of the Tennessee River and the Power Installation of the Chattanooga and Tennessee River Power Company at Hale's Bar, Tennessee.

It was presented in abstract by Major H. B. Newcomer on behalf of the author, Thomas E. Murray. Initially the paper gave facts concerning the Tennessee River, such as its length, course, navigable section, flow, high and low water stages, &c., with the total commerce of the river in one year expressed in tons carried and money value. The river is very crooked, and in parts the current is irregular and very rapid and navigation is dangerous at many points. This part showed wherein the river is in need of improvement, and a short outline of such improvement as has already been effected was given. Of various means of improvement proposed, it was ultimately decided that a dam at Hale's Bar, about 33 miles below Chattanooga, would be the most desirable, and at the same time it offered the advantage of the possibility of obtaining power.

An act of Congress was passed authorizing the Secretary of War to grant permission to the city of Chattanooga to build and construct a lock dam across the river, the city to have four months in which to take advantage of the act, after which time for eight months it would be open to two of the citizens as private individuals—C. E. James and J. C. Guild. These men succeeded in interesting capital sufficient to finance the enterprise, the leading spirit being A. M. Brady, who had associated with him as technical advisers in this work John Bogart and the author of the paper. The act allowed private parties to build the lock and dam in return for the use of water power for 99 years, and the United States was to furnish the machinery for the lock, but the power for its operation to be furnished by the company. The lock and dam were designed under the direction of Major H. B. Newcomer, Corps of Engineers, U. S. A., by John M. G. Watt, principal assistant engineer. The concern of the Government was only the conservation or improvement and the navigability of the river. The power house and all appurtenances for developing the water power were to be designed by the grantees, subject to the approval of the Secretary of War.

The head of the turbines at low water will be 39½ feet. At a flood of 25 feet there will be 27 feet head, and at a flood of 35 feet there will be 21½ feet head, and at a stage of 40 feet the head would still be about 19 feet, thus insuring a large continuous output of power under all conditions of flow. The paper further gave details of how the dam will be constructed, its dimensions, and a plan of the power development.

It was commented upon that this was the first instance in which the Government has co-operated with private enterprises in a case of this kind. In the course of some information that the speaker gave in connection with the paper, the importance of preserving forests for preventing destructive floods in rivers was brought out, and the question was raised by Calvin W. Rice as to whether or not the society had made any attempt to promote the preservation of forests. The reply being in the negative, L. D. Burlingame recommended that the society indorse a measure now before Congress for the preservation of forests. Mr. Rice put the motion that the president appoint a committee of five to draft resolutions indorsing this measure.

Summing up the paper, the speaker mentioned that it was the first instance of power development on a navigable river. He gave a list of river water powers, comparing their low water level, flow and the horse-power developed. It is noteworthy of this power development at Hale's Bar that the gates will be the highest single lift lock gates ever constructed in the United States, and the dam will be under a greater strain than any other in the country.

The next series of papers were on the general subject of water wheel governing, the first being entitled,

"Some Stepping Stones in the Development of a Modern Water Wheel Governor,"

presented by Mark A. Replogle, Akron, Ohio. The title of the paper is hardly complete, as the paper goes beyond the mere description of the development of a mechanical governor by giving a description of the machine and the principles of its construction. Beginning with a statement as to what constituted a properly constructed governor the author explains his way of obtaining the desired results. The author briefly traced the results of his experiments for a period of years up to the evolving of a mechanical differential governor, which represented his work in connection with Nathaniel Lombard. A description of this governor and its action is given with reference to drawings of the mechanism. The governor described is extremely sensitive, having been found to operate to open or close the gate with variation in speed too small to be observable with an ordinary tachometer. The governor also consumes little power, taking less than 1-10 of 1 per cent. of the total power developed.

Another interesting invention described in the paper was a device for retarding the action of the control element in a governor so as to give time for the gravity and inertia effect of the power unit before the governor has done too much. In conclusion a résumé was given of the requirements that an ideal governor should fill, in the

opinion of the author, the most important being that it should be mechanical in every detail.

Following the presentation of this paper a member moved that discussion be deferred until all the papers had been presented, on account of the limited time remaining. The motion was adopted, with the amendment that the remainder of the papers be presented by title only.

"Turbine Design as Modified for Close Regulation,"

by George A. Buvinger, Dayton, Ohio, was the second in the series of papers on water wheel governing. The paper first touches upon the different types of gates now in use, among them the most common being balanced cylinder and balanced swivel gates, which are described at some length in connection with drawings and views of turbines on which they are used. The next points considered are the connections between the governor and gate, which it is stated if properly designed will keep the variation of speed within 2½ per cent. under changes amounting to half the load. Following these are considered the draft tubes and feeders, concerning which the necessity of careful design is emphasized. It frequently happens that when turbines are supplied through a long steel feeder the inertia of the long column of water introduces difficulties in close speed regulation, as the full effect of the gate opening or closing is not immediately realized. Sometimes it is possible to remedy these conditions by fly wheels or air chambers at the turbine, but the most successful remedies are those that are applied strictly to the feeder pipe. The addition of a stand pipe to the feeder has given better results than any other method, and has been used successfully under heads as high as 250 feet. It supplies the water to the plant during the time necessary for the column of water in the feeder pipe to change from one velocity to the other under changes of load as high as 50 per cent. In place of the stand pipe it is sometimes practicable to substitute a by-pass that opens as the gates of the turbine close. In concluding, the writer declared that with a correct understanding between the engineer, the turbine builder and the governor manufacturer the most severe conditions can be met in such a manner as to obtain the closest regulation demanded in any plant.

"Speed Regulation of Water Power Plants,"

by John Sturgess, Troy, N. Y., was a paper in which it was attempted to present certain aspects of the problem of regulating water power plants, relating to certain fundamental elements of design in the water wheel itself and to the characteristics of governor action as obtained in the best practice of the day. The author makes it apparent that one of the obstacles to further improvement in speed regulation is inherent in the accepted design of the gates, which are unable to entirely discharge the function for which they are intended. Concerning governors, it was his opinion that the most successful are of the hydraulic class. It is common in America for water wheels and governors to be manufactured by separate concerns, whereas in Europe the two are usually incorporated in one design. From an engineering standpoint this is considered preferable. The principal reason why water wheel manufacturers in this country do not build their own governors is because they are not specialists in this line.

A diagram which was given showed diagramatically ideal relations between speed governor movements in low speed under existing conditions. These represent the greatest efficiency that can be obtained under prevailing conditions. An interesting part of the paper describes tests made by the author, showing the effect of sudden changing of load and sudden changing of gate opening. Illustrations show various arrangements of governors in actual installation. It is stated that under ordinary conditions of operation very good regulation can be obtained if the plant is properly laid out with consideration to the following points: The governor shall apply to the gates a definite amount of energy; it shall operate on a speed varying ½ per cent. from normal; on a considerable change of load taking place shall promptly move the gates to the position required by the changed load. It shall move the gates through their full range in 1½ seconds. Under steady head and steady load it shall remain stationary, and it shall not make more than three movements in readjusting the gates after any change of load.

The last paper in the series of water wheel governing was presented by George J. Henry, Jr., San Francisco, Cal., and had for its subject

"The Regulation of High Pressure Water Wheels for Power Transmission Plants."

The paper had special reference to the regulation of water wheels of the Pelton type rather than water turbines. At the outset emphasis was laid on the importance of protecting the pipe line where it carries a volume of water under high pressure and a break would be disastrous. In the author's opinion, while on the whole the greatest permissible rapidity of governor control is highly desirable, the addition of fly wheels with the necessarily increased windage and bearing friction is not in ordinary cases desirable. Referring to the usual methods of controlling the speed of turbines by cylinder or wicket gates, it is stated that both are open to the defect of causing a variation in the velocity of flow in the pipe line, and therefore a corresponding water ram every time the governor checks the velocity. With the Pelton type of water wheel a deflection of the stream of water from the bucket may be employed to reduce the load without interfering with the spouting velocity of the water from the nozzle. Deflecting nozzles of single pattern and cut off triple nozzles are shown in illustrations. The objectionable feature of the deflecting nozzle is its wastefulness when operating the plant at less than full load, and the objection to the cut off is that it exposes the pipe line to constantly recurring shocks, exactly the same as a turbine gate. To economize in water and secure accurate governing it has been the custom in recent years to install a combination needle and deflecting nozzle. Such a nozzle is shown in the illustration. The deflecting function is used for sudden fluctuation, and the needle follows up more permanent changes of load, and decreasing or increasing the cross-sectional area of the stream, supplies only the required amount without wasting water, and accomplishes this slow enough so as not to dangerously increase the pressure in the pipe line. The remainder of the paper is a discussion of the forms of nozzles not suited to special requirements and the governing apparatus for operating them.

On a subject closely akin to that of the last four papers mentioned was one presented by William O. Webber, Boston, Mass., entitled,

"Efficiency Test of Turbine Water Wheels."

These are records of a series of consecutive tests under uniform conditions of four water wheels, with the same apparatus and the same observers, to determine the efficiency of the wheels and ascertain the effects of corrosion and wear upon the relative efficiency of the wheels; also to determine whether more modern wheels would show greater relative efficiencies, and whether it would be more economical to operate all of the wheels at part gate all of the time or some of the wheels at full gate part of the time.

The tests are instructive because of the wide range of speeds and gate openings covered systematically and consecutively. They show conclusively that water wheels should be run at the speed for which they are designed under any given head; that modern wheels, with coarser buckets having a spoon shaped discharge depending below the guide ring of the wheel, and with the outer periphery of the bucket at discharge of greater diameter than the bucket at entrance, would give much more power, higher speed and greater efficiencies from the same water than from wheels of older design without these modern improvements.

They also show how rapidly a complete series of efficiency tests of a wheel can be made with properly designed apparatus efficiently handled by a corps of intelligent observers.

In closing the last professional session the secretary read resolutions of thanks to the Chattanooga railroad interests for special cars furnished for two of the excursions, to the Nashville, Chattanooga & St. Louis Railway for a special train which brought the party back from the Friday afternoon excursion, and a blanket resolution of thanks to the local committee for its very

esteemed service incident to preparing for and carrying out the arrangements for entertaining the society. The members of this committee were Newell Sanders, chairman; B. T. Burt, secretary; H. S. Chamberlain, W. H. Collier, J. C. Guild, William H. Hume and Major H. C. Newcomer. It is fitting to add that the *personnel* of this committee included others than members of the society, on account of the limited number of the latter residing in Chattanooga. It included representatives of the American Society of Civil Engineers, the American Institute of Mining Engineers, the American Institute of Electrical Engineers and the Corps of Engineers, U. S. A.

THURSDAY EXCURSION.

One of the most interesting and instructive excursions of the meeting was that taken Thursday afternoon to the Chickamauga-Chattanooga National Military Park. The party was conveyed to the park by trolley cars through a beautiful country, that made the ride, though an hour long, all too short. Arriving at the park, a transfer was made to tally-hos and a delightful drive through the park followed. Members of the local committee and others familiar with the history attaching to the place were distributed through the party and explained the points of interest as they were passed. The Chickamauga battlefield contains some 15 square miles and has been converted by the Government into a national park, hundreds of monuments and historic tablets being scattered about to mark the scenes of engagements. Occasional stops were made at special points, the last one being the drill ground of the Twelfth United States Cavalry, stationed at this place. After witnessing a regimental drill the party proceeded back to the city by carriages, passing over the scarcely less interesting and, if anything, more beautiful Missionary Ridge, likewise the scene of many important events in history.

FRIDAY EXCURSIONS.

Friday morning a special trip arranged by Charles W. Melcher of the Ingersoll-Rand Company, through the courtesy of H. H. Thrasher & Co., contractors, enabled all interested to visit the double track tunnel now being built by the Southern Railway through Lookout Mountain. One heading is being driven on the bottom in solid limestone and the other in loose material, requiring heavy timbering and concrete lining. To reach the work carriages were taken around the base of Lookout Mountain to the west portal, where the heading has progressed about 1500 feet. The completed tunnel, which is being driven by compressed air machinery, will be three-quarters of a mile long, and will run parallel and about 100 feet from the Nashville, Chattanooga & St. Louis Railroad right of way.

In the afternoon a trip was taken by steamboat down the Tennessee River through the mountain section below Chattanooga to Hale's Bar, 33 miles below the city, where a dam is being constructed to aid navigation and which will furnish 50,000 horse-power to factories in Chattanooga, 12 miles away in a straight line. More concerning this work will be found in the part pertaining to the improvement of the Tennessee River, the paper presented by Thomas E. Murray. After the party had inspected the work it continued by steamer to Shellmound, from which point the return trip was made by the Nashville, Chatttanooga & St. Louis Railroad.

The Final Registration.

Including members and their wives and guests, 186 were registered during the meeting.

The next annual meeting of the society will be held in New York City December 4 to 7, 1906.

James Gayley, first vice-president of the United States Steel Corporation, made the annual address before the graduating class of the Michigan College of Mines, Hancock, Mich., May 4. The address was given at the Kerredge Theater and was before a crowded audience. In addition to the Board of Control, faculty and students of the college, there were present many graduates, citizens of the copper country interested in mines and some of Mr. Gayley's own colleagues in business. Among those present were D. M. Clemson, T. F. Cole, Thomas Morrison, O. C. Davidson, Walter Fitch, William Kelley and J. M. Longyear.

President Corey on the Steel Tie.

Publication has been made in the past week of the following letter sent a short time ago by W. E. Corey, president of the United States Steel Corporation, to the presidents of a number of railroad companies, calling attention to the Carnegie steel tie and predicting that steel tie manufacture will be the next important development in the steel industry:

"In the discovery and fostering of new uses for steel I think you will agree with me that the interests of the railroads and the steel manufacturers are identical. The manufacture of steel in this country, as you know, received its first great impetus through the use of steel for rails. Further growth resulted from the use of steel in shipbuilding, pipe lines, tanks, buildings and, last, a great expansion from the introduction of steel cars.

"We confidently predict that the next great step will be the general introduction of steel shapes to replace wooden ties. By the end of this year the Bessemer & Lake Erie Railroad Company expects to have in its tracks 105,000 of these ties, which will cover 42 miles of track and weigh 9550 tons. This expenditure is based on experimental track laid by it in the fall of 1904, which has shown satisfactory results under the exceptionally heavy traffic of last year. In addition experimental lots have been laid by about ten other companies. Your people are no doubt familiar with this subject, and the purpose of this letter is to ask if we may not count on your co-operation in the successful working out of this problem, which will mean so much to us as manufacturers and to you as carriers.

"If you care to communicate with Carnegie Steel Company, Pittsburgh, Pa., it will be glad to mail you details showing the engineering features and cost of installation and maintenance as compared with wooden ties."

Anthracite Operators and Miners Agree.

On the advice of President John Mitchell, representing the Scale Committee, the anthracite miners' convention, at Scranton, Pa., May 5, voted unanimously to adopt the first proposition of the operators—namely, a continuation of the award of the Anthracite Strike Commission, with the modification that the term of the arrangement shall be mutually agreed upon. A meeting of the anthracite operators and representatives of the miners was held in New York on Monday, May 7. An agreement was signed by which the miners will work for three years longer under the award of the Anthracite Strike Commission. The miners were strenuous for a two years' agreement, on the ground that at the end of that time the cost of living would have advanced so much that a new wage scale would be necessary. The operators replied that under the sliding scale provided for in the award of the Anthracite Commission wages increase with any increase in the price of coal, which latter would no doubt advance if the cost of living generally increased. Under the sliding scale the wages of the miners increase 1 per cent. for every 5 per cent. increase over $4.50 a ton in the price of coal.

Immediately after the agreement was signed the coal companies put into effect the summer reduction in the price of domestic anthracite coal. The matter of reinstating the mine workers came up at the conference and it was finally agreed that the men who had not participated in acts of violence or in destruction of property should be taken back.

The American Pig Iron Storage Warrant Company had 24,500 tons of pig iron on hand April 30, having received in April 600 tons and delivered 6600 tons. The net reduction was thus 6000 tons.

Trade Publications.

Feed Water Heaters and Separators.—Frank L. Patterson & Co., 26 Cortlandt street, New York. Two circulars. One, a folder, deals with four of the company's specialties, including the Patterson-Berryman feed water heater and purifier, Patterson separator, Patterson exhaust heads and Patterson belt pumps. The other is concerned only with the feed water heater and purifier, and shows views and sections and contains some description in detail.

Universal Pipe.—Central Foundry Company, 116 Nassau street, New York. Catalogue and price-list U. Third edition. Size, 7 x 10 inches; pages, 66. Deals with universal cast iron pipe and fittings for gas, water, compressed air, &c., giving tables of sizes in which the pipe and fittings are made. Dimensions and list prices of universal fittings follow. The last part of the book contains matter pertaining to valves and hydrants, stop-cock boxes, roadway and valve boxes, and extension house service boxes.

Skylights.—Arthur E. Rendle, 18 West Thirty-fourth street, New York. Circular. Deals with the advantages of Paradigm skylights and fireproof windows or sidelights, giving illustrations of buildings in which they have been used and a number of testimonial letters.

Commutator and Distributer.—Crouse-Hinds Company, Syracuse, N. Y. Circular. Describes the Crouse-Hinds double ball contact commutator and distributer for use on automobile, marine and stationary gasoline engines.

Bolt Cutters.—The Standard Machinery Company, Bowling Green, Ohio. Loose leaf catalogue. The present pages deal with the Standard bolt cutter head, the Standard 1, 1¼, 1½, 2, 2¼, 2½, 3, 3½ and 4 inch single bolt cutters, and Standard 1½ and 2 inch double bolt cutters, and the Wilson patent lathe threading tool.

Power Pumps.—Van Wie Pump Company, 709 West Fayette street, Syracuse, N. Y. Catalogue A. Size, 6½ x 10 inches; pages, 64. The line which this catalogue covers includes centrifugal pumps, made in six vertical patterns—namely, plain submerged pump, pumps with yoke, vertical suction pump, vertical double suction pump, and two types of vertical top suction pumps; and in horizontal patterns plain horizontal, horizontal suction, horizontal side suction suspended and horizontal double suction pumps; also horizontal and vertical compound pumps. Sand and dredging pumps are made in two styles, and triplex power pumps are built for light, medium and heavy duties, in sizes of 2½ x 4 inches to 10 x 10 inches, belt or motor driven. The company also builds a line of deep well differential power pumping heads for deep well pumping. The catalogue does not show every separate style of pump, but covers in a general way the main points in the several different lines. Dimension tables and price-lists are given, and a line of accessories is described. Pumps are also made in engine driven and motor driven units.

Radial Drills.—The Fosdick Machine Tool Company, Cincinnati, Ohio. 1906 catalogue. Size, 6 x 9 inches; pages, 56. Concerns particularly the company's specialty, which is radial drills. These are made in two styles, known as National and Standard. The National radial drills are made with 2, 2½, 3, 4 and 5 foot arms, and were designed for handling all ordinary drilling and tapping. The Standard radial drills, made with 3, 4, 5, 6, 7 and 8 foot arms, were designed to meet the heavy duty requirements of modern practice. Views of each size and specification tables are given. A section in the latter part of the catalogue shows typical examples of motor drive; another section deals with radial drill tables, and the last section describes the two sizes of horizontal boring, drilling and milling machines manufactured.

Roller Bearings.—Hyatt Roller Bearing Company, Harrison, N. J. Bulletin 28. Contains a résumé of the advantages and applications of the Hyatt flexible roller bearing. A general discussion of the various types of friction-reducing bearings occupies the forepart, concluding with a summary of the principal points of merit of Hyatt bearings. The succeeding section dwells at some length on the principal application of the bearing, with which illustrations are given of shafting hangers and boxes, car wheels, loose pulleys and high speed machinery and automobiles. A long list of prominent users is appended, and an index to other bulletins published.

Rock Drills.—Ingersoll-Rand Company, 11 Broadway, New York. Catalogue No. 45. Size, 6 x 9 inches; pages, 96. Devoted to rock drills for mining, tunneling, quarrying and general rock excavation. In the fore part is what might be called an illustrated index. It gives a small engraving of each of the kind of tools featured in the body of the catalogue, states what each is particularly adapted for, and refers to the pages on which more extended description may be found. These tools include the auxiliary valve, arc valve, new Ingersoll, and eclipse drills, the universal tripod, the column or bar, quarry bar and the gadder. The introduction contains an account of the general characteristics of the tools and how they are made, with detailed descriptions of the parts. A description of each tool follows, interspersed with which are views of the machines in use. Accessories are listed in the back part of the book and duplicate parts. The catalogue concludes with tables and useful information pertinent to rock drilling.

Brass and Bronze.—Means Foundry & Machine Company, Steubenville, Ohio. Pamphlet. Refers to the company's specialty of bronze and brass castings for every kind of machinery, rolling mill brasses, sheet and tin mill bearings, acid metal, electric car and motor bearings, railroad brasses and engine bearings, brasses and bronzes for coal mining machines, &c. A few of the shapes made are illustrated.

Can Making Machinery.—E. F. Kirwan & Co., 33 South Gay street, Baltimore, Md. Catalogue. Covers the machinery, tools and supplies used in can making and by can houses.

Pipe Bends.—Whitlock Coil Pipe Company, Hartford, Conn. Circulars. Calls attention to the company's facilities for bending and finishing large pipe for power plants and lists standard and minimum radius bends. Another circular concerns the Whitlock atmospheric condenser, assembled of continuous coils of 2-inch pipe. The method of construction reduces the danger of leakage that attends the use of fittings.

Engines.—Ridgway Dynamo & Engine Company, Ridgway, Pa. Bulletin No. 17. Deals with the McEwen engine, a complete description of which it gives, with illustrations of the engine and sectional details of the parts. Specification tables of the standard sizes are appended. Engines are made in simple and tandem compound patterns.

Fire Service Pumps.—Goulds Mfg. Company, Seneca Falls, N. Y. Circular. Contains an account of the high pressure fire protecting plant at Coney Island, N. Y. The pumping station contains three Goulds triplex double acting pumps, direct connected to Nash gas engines, capable of delivering 4500 gallons of water per minute, with a pressure at the hydrant of 125 pounds. Specifications and views of two triplex fire pumps are given, and also of an electric rotary fire pump.

Electrically Driven Tools.—James Clark, Jr., & Co., 313 West Main street, Louisville, Ky. Circular. Deals with Willey electrically driven grinders and breast drills. The tools described and illustrated include a center grinder, adapted to be held in the tool post of the lathe, the vise of a milling machine, or the tool post of a shaper, for grinding centers or for internal grinding, or cylindrical grinding, and a breast drill for drilling small holes in large pieces, and a portable bench grinder and an electric hand drill.

Grinding.—Norton Grinding Company, Worcester, Mass. Pamphlet. Contains a paper entitled "A Few Points on Grinding," written by Charles H. Norton. The points covered are the wheels, steady rests, chatter, speed of work, traverse of work, and truing the wheel. It touches on matters of every day practice and, coming from an expert, its suggestions may be taken as authoritative. To those who have only a superficial knowledge of the possibilities of grinding it will reveal many new ideas and destroy many erroneous impressions.

Bar Work.—Gisholt Machine Company, Madison, Wis. Loose leaf from catalogue, pages 45 and 46. Concerns the Gisholt turret lathe for bar work and the tools used.

Electric Controlling Devices.—Cutler-Hammer Mfg. Company, Milwaukee, Wis. New bulletins, superceding former ones of same numbers, as follows: No. 45, compound speed regulators; No. 65, compound controllers; No. 67, nonreversible drum controllers; No. 68, drum controllers with two reverse speeds; No. 70, self starters for nonreversible motors operating belted elevators, pumps, &c.; No. 70-A, self starters for electric elevators; No. 70-D, self starters for large motors; No. 72-B, drum type reversing switch for electric elevators; No. 76-B, compound reversible slate front type machine tool controllers.

Roll Turning Lathes.—United Engineering & Foundry Company, Pittsburgh, Pa. Catalogue. Size, 8½ x 10 inches. Describes a roll turning lathe with automatic change speed gearing, arranged to drive by direct connected motor, or by belt. The lathe is made in various sizes, ranging from 16 to 60 inches. An extensive list of users of this lathe is appended.

Steam Pumps.—Canton Pump Company, Canton, Ohio. Catalogue 16-B. Size, 5 x 7 inches; pages, 64. Covers steam pumps for every service. These are made in duplex and in simplex or single cylinder patterns. A description of the general features of the pump is given at the beginning, followed by views and specification tables of pumps particularly designed for boiler feeding, general service, fire service, handling heavy liquids, outside packing pumps, pressure pumps, pumps for low steam pressure, automatic feed pumps, racking off pumps, these all being in the duplex pattern, and pumps for the same service in the simplex or single cylinder pattern are similarly treated.

Machine Tools.—B. F. Barnes Company, Rockford, Ill. Catalogue. Size, 6 x 9 inches; pages, 80. This is a general catalogue covering the company's regular products, including upright drills, gang drills, lathes, tool grinders and keyseaters. The drills are made in all sizes, from small bench patterns to 31-inch sliding gear upright drills. The gang drills are essentially combinations of the features of the single spindle drill and are made in from two to six spindle pattern of various sizes, up to 23 inches. Larger machines are built to order. Among the special machines illustrated in the book are a swinging head horizontal drilling, boring and tapping machine, an automatic revolving chuck and a gas and gasoline engine cylinder boring machine. Other regular products include motor driven grinders, foot power lathes and power keyseaters. The latter part of the catalogue deals with accessories, such as lathe tools, dogs, chucks, drill chucks, drills, &c.

THE IRON AGE

1855—1906.

New York, Thursday, May 10, 1906.

DAVID WILLIAMS COMPANY, ... PUBLISHER
CHARLES KIRCHHOFF, ... } EDITORS
GEO. W. COPE, ... }
A. I. FINDLEY, ... }
RICHARD R. WILLIAMS, ... HARDWARE EDITOR

The Status of the Merchant Blast Furnace.

Not so much has been said in recent years about the position of the merchant blast furnaceman. This may be in part because the merchant furnaceman as he was at one time known is much less numerous than formerly. The change has come not so much from consolidations absorbing blast furnaces that had long had a detached existence and making these furnaces factors in a great machine of production grounded in ore and having coal mines and coke works and producing all forms of finished products of the rolling mill. Yet there were a number of cases of such absorption in the Central West five and six years ago. The really important change has been in the lodging of the pig iron interests in fewer merchant firms, with strong raw material connections. This concentration, had it existed in April, 1898, when the National Association of non-Bessemer Pig Iron Manufacturers was organized tentatively in New York, would have gone far to insure the success of that movement, which, under the conditions then existing, actually died on coming into existence.

As a purveyor to steel works the merchant furnace has shown itself to be of special service in the present period of prosperity, when the demand for steel and finished products has been much beyond the blast furnace capacity of the large steel companies. In the development of large concerns finished steel capacity has often outrun that of connected blast furnace and melting plant. In the continuous process of adjusting and readjusting the productive machinery of the leading producers the merchant furnace has been a sort of balance wheel. And for very apparent reasons the policy of the big interests has been not to make haste to become independent of the outside producer of pig iron.

In the Mahoning and Shenango valleys merchant blast furnaces have always been a factor. At times their output has seemed too much for the pig iron market to absorb, and the project of a steel works in which the various furnaces should unite has been brought forward. In turn trade conditions have improved, demand has developed suddenly and the selfsame furnace companies that were discussing means of combining for mutual protection and for finding a new outlet for their product have had all they could do and at profitable prices in taking care of the wants of steel companies. About ten years ago some of the Bessemer furnaces of the Mahoning Valley found relief from a strained situation through the organization of the Ohio Steel Company, which in time took up a considerable part of the product of these furnaces. When this company built its own furnaces the occupation of the merchant furnaces of the two valleys again seemed gone. In 1899 and the two years following the various steel consolidations were being formed and the prospect seemed quite remote for the full and profitable operation of purely merchant stacks. The steel works project was again mooted, and whenever in the past few years the United States Steel Corporation has seemed on the eve of taking care of all its requirements in pig iron it has been brought forward as the only solution of the situation. In 1905, when the Youngstown Sheet & Tube Company definitely made its plans for a Bessemer steel plant, various furnace companies became interested. The steel plant is now nearing completion, and within a few months the output of three or four Valley furnaces, in addition to that of its own stack, will be required by the converters of the Youngstown Company. Meantime the status of other Valley furnaces has changed and a large single merchant interest has been built up in the Shenango Valley. In part due to the changes indicated, the membership of the Bessemer Pig Iron Association, which at one time represented 17 or 18 furnaces, now stands for about half as many.

But while the number of furnaces making iron to sell to steel companies, and existing independently, has grown less, the foundry merchant furnace interest has expanded in recent years. This development has been particularly marked in the Central West and the West. Strong companies with ore and coke of their own have built furnaces at Buffalo, Cleveland, Toledo, Detroit and Chicago. The leading merchant furnace company in the Shenango Valley is planning to erect two additional furnaces, apparently on the assumption that steel making pig iron will yet find an ample market. Near Pittsburgh, the first merchant furnace built in that district in some years is nearing completion, while another western Pennsylvania furnace is to be built by an important Cleveland iron ore and blast furnace interest. At Chicago and Milwaukee more furnaces are building or to be built, to supply the foundry trade in tributary districts. In the charcoal iron industry of Michigan and Wisconsin, moreover, the only real development in years has come since the business drifted into strong hands with ample ore and timber supplies. In the East ore ownership or long time ore contracts insure the position of the leading makers of foundry iron.

The tendency in the South is distinctly toward the turning of more of its pig iron into steel, and there has been a falling off in the past five years in the percentage of the growing foundry iron trade of the North supplied by Southern furnaces. The foundry iron furnaces of the North may thus expect some immunity in the future from the severe competition they have had at times from Southern sources. This may be of particular advantage to the smaller furnaces in southern Ohio and in parts of Pennsylvania, which have to buy both ore and coke in the market. It is evident that the real competition in Northern foundry iron markets, in times of special stress, will be between the self contained producers in the Buffalo district and the larger Eastern interests, so far as New York and New England markets are concerned, and between the large producers in the lake cities, apart from Buffalo, so far as important Central Western markets are concerned.

Opening the Gates Wider to Borrowers.

The national House of Representatives has passed the bill which amends the national banking laws by adding the surplus to the capital stock of a national bank in determining the limit of loans to any one borrower. The present limit is 10 per cent. of the capital stock of a bank. This bill would make the limit 10 per cent. of combined capital and surplus, provided that the amount shall not be more than 20 per cent. of the capital stock. Many conservative bank officials do not favor the proposed change. It would of course favor the large bor-

rower. In certain instances it would be opposed to the interests of the small borrower, for when a bank can dispose of its funds in large loans smaller customers often find it harder to secure accommodation.

Usually the surplus is a very considerable percentage of the capital stock of a bank. Frequently the two are equal. In such instances the present limit would be doubled. The restriction is intended to limit losses on bad paper. The change raises the limit. A greater chance for unscrupulous or inefficient management is made. A little country bank, with its $25,000 or $50,000 capital, can ill afford to lose one-fifth of the amount. Neither can the great city bank afford it. In times of panic the danger of bank failures is increased. These are the arguments against the change. On the other hand, great convenience could be extended to perfectly good customers by the ability to make larger loans. It is a well-known fact that the 10 per cent. law is frequently violated. The Comptroller of the Currency was quoted in Congress to that effect. When everything is considered, it is not so much the law as the *personnel* of the management of a bank which counts.

The Extent of the Steel Car Industry.

There are now seven distinct companies of important commercial proportions manufacturing standard freight cars of steel construction in the United States. They operate ten plants, which are at present turning out between 250 and 275 steel and steel underframed cars per day, or between 75,000 and 90,000 per year. It is not easy to draw a clear line, either as to the number of plants or the daily output, for the reason that a number of establishments manufacture cars of steel construction for various purposes, which are not standard railroad cars, while those which do make standard cars turn out large numbers for special purposes, as for the iron mining regions, which are of less than the maximum capacity, and in running on which the output of the plant, in number of cars per day, is increased. The seven manufacturers referred to above are the Pressed Steel Car Company, the Standard Steel Car Company, American Car & Foundry Company, Cambria Steel Company, Ralston Steel Car Company, Middletown Car Works and the Barney & Smith Car Company. The Pullman Company is preparing to build standard steel freight cars, and therefore will shortly be added to the list. Besides these there are a number of manufacturers who turn out small cars of steel construction, and some of them are not unlikely to grow into the business of making full sized cars of steel.

In the early days the impression gained some prevalence that the manufacture of steel cars was to be more or less completely monopolized through the existence of patents. Claims were made that certain forms of construction which were pre-empted offered such great advantages over ordinary forms of construction which might be devised as to amount to practical exclusion. Time has shown in this, as in many other cases, that the particular form in which some great departure is made is merely a pioneer, and advantages which inhere in the general departure are credited to the particular form. The advantage of the steel car lies in the fact that it is made of steel and not of wood.

There was some necessity at the start for a "talking point." The railroads were naturally somewhat slow in embracing the abrupt departure involved in substituting much heavier cars, despite the great advantages of decreased dead weight proportionate to live weight, and decrease in train length for the same total tonnage. It was desirable, therefore, to minimize as much as possible the increase in weight per car, irrespective of the increased service promised. Furthermore, the mere change from wood to steel looked, if the expression be permitted, "too easy," and to surround the subject with some more complicated novelty made the transition more acceptable.

It has been but natural that other manufacturers should enter the field, though on a much more modest scale than that adopted by the two or three largest interests, and it is certain that others will follow. A list compiled by the American Iron and Steel Association to January 1, 1903, contained 162 carbuilding works, which of course comprised wooden car plants almost exclusively. The wooden car is now ordered only where steel car deliveries cannot be had, or where the service required is relatively unimportant. The owners of many of these plants are doubtless now considering the prospects of getting into the steel car field. Certainly their future as builders of wooden cars is not particularly bright.

Steel car orders have not come out in any volume for some weeks simply because early deliveries cannot be had. The railroads are ready to buy more steel cars, and with a continuance of favorable financial conditions will buy cars in a rush whenever the pace is set and the prospect of deliveries is not too remote. The steel car plants are filled up completely for the present year, with the possible exception of one or two of the newest, and it is certain that within the near future, or at any rate long before present business is worked out, a good line of fresh car orders will be placed, if no accidents intervene.

Machine Tool Costs.

The Machine Tool Builders' Association has begun an important and profitable work in taking up the subject of cost system as applied to this line of manufacture. The purpose is to eliminate from the business, through a campaign of education and assistance, the competitor who fixes the selling price of his product without any real knowledge of the cost of production. It may be easily realized that when a manufacturer believes he is building a machine at a certain cost, when in reality the cost is considerably greater, he is basing his selling price on a false foundation, which results not only to his own loss but to that of the trade as a whole. This error may exist in works where the product is confined to a very narrow line, but it more frequently occurs where there is a variety of product, in the way of several types of machines or a range of sizes of some one tool, such as lathes. Without a comprehensive cost system the manufacturer is in a sense guessing, for he is basing his calculations on inadequate figures. He may be figuring his costs too high on some machines and too low on others, and usually the error is of the latter class.

No manufacturer ever established a real cost system without ascertaining that he had been far off on some of his costs. If a machine tool builder believes that his cost is lower than the reality the selling price is generally proportionately low and his presence in the market is demoralizing and harmful. The same condition existed among the stove manufacturers up to a few years ago. Each had a system which he believed told the true story of his costs. However, a movement was finally started to investigate the whole subject, and the outcome was the discovery of fallacies in the several systems which meant loss of money, either because not all the elements

of costs were included, or because their distribution among the products was not equable. A general system applicable to this line of manufacture was evolved and generally adopted. Competition was placed on a basis which did much toward standardizing prices, and the general prosperity of the business was materially bettered. There appears to be no obstacle in the way of a similar system which would be applicable to the building of machine tools. The committee chosen to do the work is one quite competent to handle the subject, and the result of its investigations will doubtless accomplish a great deal in effecting an equitable schedule of prices.

Misfit Corporate Names.

While a well-known and respected corporate name is a most desirable manufacturing asset, yet there are not infrequent instances where a name is a source of considerable trouble and even expense to the managers of a business because the title is misleading respecting the present product of the company. The name was originally determined upon to designate a product which was the company's leader at the time. The Blank Foundry Company, for instance, was established to manufacture castings, but in the course of time the building of machinery has become the chief feature of the industry. Little emery is now used for abrasives, comparatively speaking, and there are emery wheel companies, so named, which employ little or no emery in making their wheels. Many individual instances of this misfit of name with product could be cited. The problem of what to do about it causes serious thought to the executive officers. It is a difficult choice between retaining a name known familiarly to the trade, though it be misleading, or changing it to its correct meaning and doing the necessary advertising to impress upon the minds of customers past, present and future that the new is merely the old brought up to date. Nowadays it really does not take long to establish the new name. The public is quicker to adapt itself to changes, and the old becomes history and the new a matter of fact almost before the first lot of new office stationery has been consumed. But nevertheless there is a lesson for the founders of new corporations in the experience of these older manufacturing houses in the desirability of selecting a name which will stand regardless of changes in products.

The Zug Iron & Steel Company.—This is a new corporation organized at Pittsburgh May 1 with a capital of $1,000,000, to take over the entire business of Zug & Company, Limited, operating the Sable Iron & Nail Works, which was dissolved by limitation some time ago. All accounts due the old concern are payable to the Zug Iron & Steel Company, which will continue the manufacture of the Sable brands of high grade forging irons, stay bolts and special irons for railroad and shop work, also the Sable brands of iron and steel sheets, both black and galvanized. Charles H. Zug is president, Charles G. Zug, vice-president; Charles H. Reid, treasurer, and A. M. Brown, secretary.

Electric Power for Lackawanna Steel Company.—For the carrying out of a contract recently entered into for a term of years by the Lackawanna Steel Company with the Niagara, Lockport & Ontario Power Company an extensive installation is being made at the Buffalo works of the Steel Company. It consists of seven 1500 horsepower transformers and a number of motor generator sets. The transformers receive a current of 59,000 volts, and for its distribution through the steel works the equipment required will represent an expenditure of about $250,000. The contract just entered into will mean the general employment of electric power throughout the plant. The electrical machinery will be furnished by the Westinghouse Electric & Mfg. Company.

CORRESPONDENCE.

Rates on Coke and Pig Iron to Chicago.

To the Editor: The rate on coke from the Pocahontas field to Chicago, 650 miles, is $2.35 per ton. The rate from the same field to the Hanging Rock district, 250 miles, is $1.55 per ton. With 400 miles further to haul, Chicago pays only 80 cents more per ton than the southern Ohio district. The rate from the latter on pig iron to Chicago is $2.30 per ton. Coke consumption being equal, it costs Chicago 80 cents more for fuel for one ton of pig iron than it does the Ohio furnaces in question. This difference is more than made up by the less cost of ore at Chicago. It follows then that the $2.30 per ton rate on pig iron shuts these Ohio furnaces out of Chicago, or that Chicago furnaces can make $2.30 more per ton on pig iron than the former. On the basis per ton paid for hauling coke into the Hanging Rock district Chicago should pay $3.90 per ton, or on the Chicago basis these Ohio furnaces should pay about 90 cents, or their pig iron should be hauled to Chicago for 80 cents. The question is, Why should Chicago be so favored, or Ohio districts so discriminated against? There is not enough iron made in Chicago to supply the local demand, and production is to be increased to meet this demand and to supply markets outside of Chicago. If Chicago had not the favors she is not legally and morally entitled to this would not be the case. Chicago is a good place in which to make iron and manufacture it, simply because the railroads make such rates there to her advantage on raw material, and to the disadvantage of outside makers and manufacturers, on pig iron, that competition is out of the question. There is nothing else to it. Would the United States Steel Corporation do what it proposes to do near Chicago if it paid $3.90 per ton for hauling coke over 600 miles, or if the railroads hauled pig iron into Chicago for the same charge per mile as they haul coke?

Is it not possible the prospective legislation by Congress will put business upon a legitimate basis for all and stop such discrimination as now prevails in favor of Chicago and other points? The position of these Ohio furnaces as regards Chicago is used as an illustration of a situation that exists in many instances.

The little fish all over the country are being netted for the sustenance of the large ones. The country is getting restrictive, and the restrictive legislation on foot is the result. What will it amount to and where will it end? Certainly we must in time have a "square deal" in this country or worse: the mileage basis absolutely or government ownership, neither of which is sensible or practicable. A "square deal" is the easiest solution. Why not have it, and not be forced to take refuge in the arms of evils we should avoid? OHIO.

At a banquet held under the auspices of the National Metal Trades Association and the New York and New Jersey branch, in Newark, N. J., April 24, addresses were made by W. D. Sayle, Cleveland, president of the National Association; D. F. McPherson, secretary of the Philadelphia branch; Charles A. Haney, Sloan-Chace Company, Newark; Peter Weber, the Edison Phonograph Works, and H. C. Hunter, secretary of the New York and New Jersey branch.

Railroad building in India to the extent of about 3500 miles is to be carried on by the Government within the next three years, while surveys for 2000 miles additional are being made. During the succeeding three years about $50,000,000 will be expended for this purpose. Owing to the scarcity of railroad building equipment in India it is likely that many large orders will be placed in Europe, and possibly in the United States.

Six 15,000,000-foot gas holders, the largest in the world, are under construction for the Consolidated Gas Company, at Astoria, L. I. These holders, each of which will be 300 feet in diameter, will be lifted to a hight of 260 feet when filled.

Some Surprising Tin Plate Statistics.

BY "CASSITERITE."

The Director of the Census recently made public a preliminary summary of the statistics of the manufacture of tin plates and terne plates in the United States in the year ending December 31, 1904, comparing the production in that year with the production in the census year ending May 31, 1900. The statistics show a fair growth in the industry in the interval of a little less than five years. The combined production of tin and terne plates plates amounted to 1,026,384,851 pounds in 1904, as compared with 849,004,022 pounds in 1900, an increase of 177,380,829 pounds, or over 20 per cent. Of the 1904 total 867,526,985 pounds, or 84.5 per cent., were tin plates and 158,857,866 pounds, or 15.5 per cent., were terne plates. In 1900 the production of tin plates amounted to 707,718,239 pounds, or 83.4 per cent. of the total, and the production of terne plates to 141,285,783 pounds, or 16.6 per cent. of the total. It will thus be seen that there was a slight proportionate increase in the production of tin plates in 1904 as compared with 1900 and a slight proportionate decrease in the production of terne plates. The value of the tin plates and terne plates produced in 1904 amounted to $34,549,543, as compared with $31,284,145 in 1900, an increase of $3,265,398, or 10.4 per cent.

Statistics for 1900 and 1904 Compared.

The preliminary summary of the Bureau of the Census, which is now under the jurisdiction of the Department of Commerce and Labor, is as follows:

Details.	1904.	1900.	Per cent. of increase.
Number of establishments	36	57	*36.8
Capital	$10,813,239	$6,650,047	62.6
Salaried officials, clerks, &c.:			
Number	275	333	*17.4
Salaries	$301,454	$291,323	3.5
Wage earners:			
Average number	4,847	3,671	33.0
Wages	$2,383,070	$1,889,917	26.1
Miscellaneous expenses	$391,023	$236,456	65.4
Materials used, total cost	$31,375,714	$26,728,150	17.4
Black plates:			
Pounds	1,019,608,657	827,915,599	23.2
Cost	$22,992,006	$20,668,848	11.2
Pig tin and pig lead:			
Pounds	32,445,104	27,154,258	19.5
Cost	$7,075,722	$4,927,690	43.6
All other materials	$1,307,986	$1,132,212	15.5
Products, total value	$35,283,360	$31,892,011	10.6
Tin plates:			
Pounds	867,526,985	707,718,239	22.6
Value	$28,429,971	$25,553,021	11.3
Terne plates:			
Pounds	158,857,866	141,285,783	12.4
Value	$6,119,572	$5,731,124	6.8
All other products	$733,817	$607,866	20.7

* Decrease.

Changes in the Industry.

In making public the above statement the Director of the Census says that a somewhat different plan was adopted in 1904 in enumerating establishments from that followed in 1900. In the latter year every plant which manufactured tin plates or terne plates was counted as an establishment, but in the former years this was not done, and 6 plants which in 1900 were counted as 6 establishments were in 1904 counted as 3 establishments. This will account in part for the decrease in active establishments from 57 in 1900 to 36 in 1904, a loss of 21 establishments. In the period under review 16 plants were abandoned or dismantled or went out of the tin plate or terne plate business; 6 plants which were active in the census year 1900 were idle during the census year 1904, and 5 plants were otherwise classified in 1904 owing to changes in the character of their business. Nine plants which were not engaged in the manufacture of tin and terne plates in 1900 reported their manufacture in 1904.

Wages and Wage Earners.

The average number of wage-earners employed in 1904 shows an increase over 1900 of 1176, and the total wages paid increased $493,153. The average earnings of wage-earners were, however, considerably less in 1904 than in 1900, the amount earned by each individual in 1900 having been over $514, as compared with about $492 in 1904, a decrease of $22 per wage-earner. In the preliminary statement for 1904 the age and sex of wage-earners are not given, but in 1900 the 3671 wage-earners then reported were divided as follows: Men, 16 years of age and over, 3014; women, 16 years of age and over, 625; children, under 16 years, 32.

The cost per pound of black plates used amounted in 1904 to 2.25 cents, as compared with 2.49 cents in 1900, a decrease of almost ¼ cent. The cost of pig tin and pig lead shows a considerable increase in 1904 over 1900, having been in the latter year 18.1 cents per pound and in the former year 21.8 cents per pound, an increase of 3.7 cents.

The value per pound of the tin and terne plates made in 1904 was 3.36 cents, as compared with 3.68 cents per pound in 1900, a decrease of 0.32 cent. The tin plates made in 1904 were valued at 3.27 cents per pound, as compared with 3.61 cents per pound in 1900, a decrease of 0.34 cent per pound. The terne plates averaged 3.85 cents per pound in 1904, as compared with 4.05 cents per pound in 1900, a decrease of exactly 1-5 cent per pound.

Profits Fall Off Greatly.

If the materials used and the products turned out in 1904 and 1900 are compared some rather astonishing results are obtained—results which cannot be accepted as correct. Take the matter of expenditures for the two years and compare the totals with the value of all the products reported, as shown below:

Expenditures.	1904.	1900.
Salaries of officials, clerks, &c.	$301,454	$291,323
Wages	2,383,070	1,889,917
Miscellaneous expenses	391,023	236,456
Materials used	31,375,714	26,728,150
Total expenditures	$34,451,261	$29,145,846

While the number of salaried officials, clerks, &c., decreased from 333 in 1900 to 275 in 1904, their earnings increased as shown above, the average being $1,096 in 1904 against $875 in 1900.

Deducting the expenditures from the value of all the products reported for the two years we have the following somewhat remarkable showing:

	1904.	1900.
Value of all products	$35,283,360	$31,892,011
Total expenditures	34,451,261	29,145,846
Approximate gain	$832,099	$2,746,165

Assuming as correct the statement that capital invested in 1904 amounted to $10,813,239 and in 1900 to $6,650,047, the table shows that in 1904 the approximate net earnings amounted to less than 8 per cent., as compared with over 41 per cent. in 1900. In 1904, on a business of over $35,280,000, the net gain was only a little over 2.3 per cent., while in 1900 it amounted to over 8.6 per cent. This would indicate that the tin plate industry in 1904 suffered hardship beyond anything indicated by market conditions. The important fact should not be overlooked that the Census Bureau does not include as expense the cost for enlarging a plant, erecting new buildings, adding new machinery, &c., taking the stand that expenses of this kind should be included in capital invested. If expenditures of this character were included for 1904, the tin plate and terne plate manufacturers would probably have very little left of the $832,000 of earnings above shown at the close of that year.

Loss in Material Much Increased.

Another curious result is reached if a comparison is made between 1904 and 1900 of the loss in material in manufacturing black plates into tin plates and terne plates. Here are the comparative figures:

Materials consumed:	1904.—Pounds.	1900.—Pounds.
Black plates	1,019,608,657	827,915,599
Pig tin and pig lead	32,445,104	27,154,258
Totals	1,052,053,761	855,069,857
Deduct finished tin plates and terne plates	1,026,384,851	849,004,022
Approximate loss in manufacture	25,668,910	6,065,835

A loss of 25,668,910 pounds in 1904 in manufacturing 1,026,384,851 pounds of tin plate and terne plate, as compared with a loss of only 6,065,835 pounds in 1900 in manufacturing 849,004,022 pounds of tin plate and terne plate is certainly remarkable and should be accom-

panied by an explanation. The increased loss in 1904 caused by the white pickling of the black plates, the resquaring or reshearing of the finished terne plates, &c., should be in proportion only to the increased production of tin plates and terne plates in that year. In the above statement in neither year has the loss of palm oil, zinc and muriatic acid (from which the chloride of zinc known as "flux" is made), bran, pink meal, &c., been considered. In 1900 the palm oil alone consumed in the process of manufacture amounted to over 5,500,000 pounds, almost all of which was lost. In 1904 the consumption of palm oil certainly amounted to 6,000,000 pounds, and may have reached 6,500,000 pounds. Taking into consideration all losses of material from the black plate to the finished terne plate an allowance of, say, 1.2 per cent. may be considered fair. On this basis the loss in manufacture amounted in 1900 to approximately 10,577,000 pounds, and in 1904 it would be perhaps 12,316,000 pounds. But a loss in manufacture in 1904 of about 32,000,000 pounds, as indicated by the statement of the Census Office, an allowance of 6,000,000 pounds for palm oil in 1904 having been made, is almost incredible.

Verification of Figures Suggested.

To summarize our comparisons: A gain in 1904 as compared with 1900 of $221 each in the annual earnings of salaried officers and clerks, an annual loss each of $22 in the wages of workingmen and workingwomen, net earnings in 1904 on capital invested of less than 8 per cent. and on business done of only a little over 2.3 per cent., as compared with over 41 per cent. on capital invested and of over 8.6 per cent. on the business transacted in 1900, and a loss of material in manufacture in 1904 of perhaps 32,000,000 pounds, as compared with 10,577,000 pounds in 1900, are matters of grave importance—too grave for the Census Office to give to them the stamp of official authority unless it is absolutely certain that its figures are correct.

The tin plate and terne plate industry is one of the most important of our new industries. Its growth in the last ten years has been almost phenomenal—from 166,343,409 pounds in 1894 to 1,026,384,851 pounds in 1904, or over 517 per cent. For several years the exact production of tin plates and terne plates in this country has not been ascertained annually. Naturally statistics collected by the Census Bureau or by any other reliable organization concerning the industry will be welcomed by manufacturers. But these statistics must appeal to the manufacturers as being at least approximately correct before they will be accepted. It is therefore to be hoped that before printing its final report on the tin plate and terne plate industry for 1904 the Census Office will have these preliminary figures gone over carefully, so that any errors may be eliminated and the report made as accurate and complete as possible.

In landing the shore ends of heavy submarine cables two light ropes are brought ashore from the ship. One is passed around a rigidly secured pulley and then spliced to the other. A heavy rope is then pulled to shore from the ship, which is anchored, and by means of this heavy rope the cable itself is finally started. On its way to the shore it passes over a number of barrels conveniently spaced, the idea being to minimize the difficulty of haulage. When the shore end of the cable is secured the barrels are released and the cable drops to the bottom and assumes its final location. Similar methods are used for both ends of the cable, the difference being that after landing the first end the vessel heads for sea, paying out cable as it goes, while in the other case, after the cable is landed, all that is necessary is to take up the sag between ship and shore.

The Falls Hollow Staybolt Company, Cuyahoga Falls, Ohio, states that the Berger-Carter Company, its Pacific Coast agent, whose members were sufferers from the San Francisco fire, temporary address, Third and Washington streets, Oakland, Cal., formerly located at 34-40 Beale street, San Francisco, Cal., reports that it will resume business on a larger scale than ever in new quarters with new stock, &c.

Extraordinary Prices for Pig Tin.

When a commodity used so widely throughout the world as pig tin advances by leaps and bounds, as this metal lately has, the fact is worthy of more than passing attention. A month ago sales were made at 38½ cents, a week ago at 40 cents, while this week the high price of 43½ cents has been realized for 5-ton lots. The metal has advanced over 50 per cent. in the last year, as one year ago it was sold at 28½ cents. In spite of these high prices the consumption is keeping up and dealers in the metal report business brisk. This is to be expected, as for some time past consumers believed the market too high and conequently bought only as their immediate needs warranted, with the result that they are now compelled to re-enter the market. This hand to mouth consumption, of course, adds many elements of strength to a market already in an excellent statistical position. In fact, prices in the United States to-day are nearly 1 cent above import cost, indicating clearly the premium which spot metal commands. This condition has been brought about owing to the light supplies received here, and to the small stocks in this country on the first of the month. At present the situation is such that no more May supplies can be shipped directly from the Far East, and any metal that does come to this country must come from London on the next two steamers.

At present prices importers generally are reluctant to make large commitments, as they fear the market may drop away from them while supplies are on the way from Europe. The advance of the last few days is partially the result of speculation and overbuying of both spot and future supplies by foreign operators. It is a significant fact that the last advance in London of nearly £25 has been brought about on little or no specific information. The London market is in such a state that those who are in a position to buy are afraid to do so, fearing that the market may drop, while those who believe that lower prices will be the rule are reluctant to sell because of the ease with which this last advance of £25 was made. The bull movement which has been running for the past six months is generally attributed to two of the leading operators in London, but the belief is also expressed that the market is running away from even these men who are conversant with the situation.

There is no gainsaying that statistics are favorable for higher prices than a year ago, and in this connection the accompanying table showing the world's consumption per year and visible supply on the first of April of each year is interesting. It shows that in 1900 the visible supply amounted to 21 per cent. of the yearly consumption, while on April 1 of this year the percentage had fallen to an amount that is 12 per cent. of last year's consumption, with the consumption of 1906 promising to be greater than that in 1905.

Consumption and Visible Supply Compared.—Gross Tons.

	1906.	1901.	1902.	1903.	1904.	1905.	1906.
Consumption	77,200	84,750	87,970	89,000	92,400	90,550	....
Visible supply	16,191	16,128	15,596	15,987	13,695	13,063	11,104

Another factor of interest is that the opening of new mines of the Straits Settlements has been discouraged by the Government and the old workings are not as rich as formerly. The political situation in South Africa, too, has a further bearing on the supply, as there has been a migration of coolies now laboring in the Transvaal, which naturally makes coolie labor higher in the Straits. In spite of the prospect for higher prices as far as the statistics are concerned it is significant that some of those well informed about the situation, who have been consistently holding out for higher prices during the past year, are now decrying the wild scramble for the metal and express the belief that while higher prices may be the rule, still the present sharp advance is hardly justifiable. There is, too, the familiar fact, borne out by history, that when a commodity seems to be rising in price beyond all reason either new supplies are discovered or some substitute is found.

Pig Iron Production Slightly Less.

Following the high record made in March, pig iron production in April fell off slightly. As a 30-day month, April would be expected to show a total of about 3 per cent. below that of March if the rate of production remained the same. But there has been a small decrease in the rate, our statistics showing 2,073,645 gross tons of coke and anthracite iron produced in the month, as compared with 2,165,632 tons in March. This is at the rate of 69,121 tons a day in April, as against 69,859 tons a day in March. There was some reduction in the output of furnaces in the districts depending in part upon anthracite coal, and in some other directions irregular working is reported. The weekly capacity of the 296 furnaces in blast on May 1 was 484,031 tons, against 484,240 tons for 297 furnaces on April 1.

In the following table is given the production for February, as compared with the records for the preceding four months:

Monthly Pig Iron Production.—Gross Tons.

	December. (31 days)	January. (31 days)	February. (28 days)	March. (31 days)	April. (30 days)
New York....	120,016	119,097	121,484	135,713	127,674
New Jersey...	21,548	16,259	18,280	28,840	33,951
Lehigh Valley.	57,503	56,215	55,218	62,724	56,718
Schuylkill Val.	41,150	48,674	47,852	54,826	52,492
Lower Susquehanna and Lebanon Val..	65,907	75,214	57,979	69,225	61,831
Pittsburgh dis.	488,346	511,941	454,611	533,100	498,874
Shenango Val.	176,009	177,467	153,551	178,378	172,342
West. Penn...	114,559	109,695	105,177	106,338	105,190
Md., Va. and Kentucky....	79,749	83,704	75,251	83,031	75,030
Wheeling dis..	120,147	113,611	114,324	126,343	113,188
Mahoning Val.	162,052	162,075	148,508	169,468	163,019
Central and North. Ohio..	173,453	162,938	154,298	173,494	163,152
Hocking Valley and Hanging Rock	33,902	34,656	32,514	36,675	33,998
Ill.,Mich.,Minn., Wis., Mo. and Col.....	225,947	222,736	197,495	231,815	240,043
Alabama.....	137,560	141,773	134,792	135,739	137,049
Tennessee, No. Carolina and Georgia.....	27,870	32,838	32,698	39,923	39,094
Totals....	2,045,718	2,068,893	1,904,032	2,165,632	2,073,645

Production of Steel Companies.—Returns from all the plants of the United States Steel Corporation, the Cambria, Pennsylvania, Maryland, Lackawanna, Wheeling, Republic, Jones & Laughlin, La Belle, Bethlehem, Calumet and Colorado companies show the following totals of product month by month. We present also separately monthly figures of the production of spiegeleisen and ferromanganese, which is included in the total:

Production of Steel Companies.—Gross Tons.

	Pig.—Total production.—			Spiegeleisen and ferromanganese.	
	1904.	1905.	1906.	1905.	1906.
January	502,994	1,129,042	1,358,015	21,002	26,305
February	756,260	1,027,937	1,226,760	22,431	26,988
March	913,412	1,232,255	1,400,395	21,280	23,595
April	974,006	1,222,710	1,333,591	20,038	28,054
May	927,534	1,287,438	.....	24,732	....
June	788,822	1,149,404	.....	21,761	....
July	694,892	1,114,409	.....	31,220	....
August	747,570	1,186,050	.....	27,461	....
September	936,494	1,262,033	.....	21,645	....
October	971,447	1,370,960	.....	26,799	....
November	962,384	1,334,644	.....	23,776	....
December	1,019,841	1,356,962	.....	29,481	....

Among furnaces blown in in April are one Lackawanna at Buffalo, Musconetcong and Pequest in New Jersey, one Cambria at Johnstown, Emma at Cleveland, Globe in the Hanging Rock region, one South Chicago, Spring Valley in Wisconsin, one Ohio at Youngstown. One Edgar Thomson spiegel furnace was turned to Bessemer, taking the place of a furnace that went out for repairs. Among furnaces blown out or banked in April and that were inactive on May 1 are the following: One Henry Clay in Schuylkill Valley, one Crane and Macungie in the Lehigh Valley, one Lebanon of the Pennsylvania Steel Company in the Lebanon Valley, West End and Max Meadows in Virginia, Riverside and Belmont in the Wheeling district, Haselton in the Mahoning Valley and one Dayton in Tennessee. Victoria in Virginia, which went out on March 25 and is still out was not reported in the inactive list of one month ago. The net change between April 1 and May 1 is a loss of one furnace, 296 being active at the beginning of this month.

The table below gives the active capacity of furnaces producing coke and anthracite iron on May 1 and the corresponding figures for April 1:

Coke and Anthracite Furnaces in Blast.

Location of furnaces.	Total number of stacks.	May 1. Number in blast.	May 1. Capacity per week.	April 1. Number in blast.	April 1. Capacity per week.
New York:					
Buffalo 13	13	13	28,293	12	26,425
Other New York...10	10	4	4,297	4	4,316
New Jersey..... 8	8	7	7,822	5	6,322
Spiegel 2	2	1	195	1	196
Pennsylvania:					
Lehigh Valley.....27	27	16	11,802	18	13 762
Spiegel 2	2	2	416	2	396
Schuylkill Valley...13	13	11	12,248	12	12,380
Low. Susquehanna.. 9	9	4	6,465	5	6,916
Spiegel 1	1	1	543	0	0
Lebanon Valley....11	11	10	7,420	10	8,316
Spiegel 0	0	0	0	1	399
Pittsburgh dist....41	41	39	113,767	39	117,523
Spiegel 3	3	3	2,640	3	2,852
Shenango Valley...20	20	19	40,213	19	41,181
West. Penn.....24	24	19	25,244	18	24,010
Maryland 5	5	4	7,745	4	7,035
Wheeling dist.....14	14	11	22,410	13	28,469
Ohio:					
Mahoning Valley...16	16	15	37,636	15	34,767
Cent. and Northern and Michigan....19	19	19	39,749	18	39,219
Hocking Valley and Hanging Rock...12	12	12	8,096	11	8,590
Illinois 19	19	19	40,405	18	39,109
Spiegel 2	2	2	1,798	2	1,257
Minnesota 1	1	1	1,328	1	1,146
Wisconsin 5	5	5	5,368	4	4,837
Missouri 1	1	1	895	1	994
Colorado 4	4	3	5,901	3	2,598
Spiegel 1	1	1	827	1	229
The South:					
Virginia 23	23	11	8,245	13	10,549
Kentucky 7	7	2	1,164	2	1,121
Alabama 46	46	26	31,978	26	30,243
Tennessee 16	16	14	8,177	15	8,358
Georgia 1	1	1	944	1	725
North Carolina..... 1	1	0	0	0	0
Totals 377	377	296	484,031	297	484,240

For a series of months the active coke and anthracite capacity fluctuated as follows in gross tons:

	Capacity per week.		Capacity per week.
May 1.....	484,031	February 1.....	273,692
April 1.....	484,240	January 1, 1904.....	185,636
March 1.....	479,737	December 1, 1903.....	244,156
February 1.....	482,156	November 1.....	273,715
January 1, 1906.....	463,673	October 1.....	353,142
December 1, 1905.....	475,814	September 1.....	360,197
November 1.....	460,449	August 1.....	353,681
October 1.....	445,468	July 1.....	384,825
September 1.....	412,563	June 1.....	388,178
August 1.....	410,088	May 1.....	373,496
July 1.....	408,617	April 1.....	386,215
June 1.....	443,092	March 1.....	347,424
May 1.....	452,031	February 1.....	335,339
April 1.....	439,564	January 1, 1903.....	346,073
March 1.....	403,157	December 1, 1902.....	336,617
February 1.....	405,792	November 1.....	330,110
January 1, 1905.....	377,879	October 1.....	337,837
December 1, 1904.....	357,846	September 1.....	328,243
November 1.....	334,249	August 1.....	328,745
October 1.....	319,249	July 1.....	303,793
September 1.....	291,573	June 1.....	337,492
August 1.....	246,092	May 1.....	337,627
July 1.....	272,301	April 1.....	331,140
June 1.....	336,107	March 1.....	316,039
May 1.....	368,244	February 1.....	325,440
April 1.....	337,257	January 1, 1902.....	291,992
March 1.....	308,751		

Preparations are being made by the International Association of Machinists for a general demand through its locals for an eight-hour working day, to go into effect on a date that will be determined this month. President O'Connell of the International Association is to confer with officers of Local No. 15, New York, concerning the demand, which it is stated will affect 100,000 machinists throughout the country. At present union machinists are working nine hours a day.

NEWS OF THE WORKS.

Iron and Steel.

One crane furnace of the Empire Iron & Steel Company at Catasauqua, Pa., was blown out April 24, and Macungie Furnace, at Macungie, was blown out April 19.

Haselton Furnace of the Republic Iron & Steel Company, at Youngstown, Ohio, was blown out April 7.

One Lebanon Furnace of the Pennsylvania Steel Company, at Lebanon, Pa., was blown out April 4.

Spring Valley Furnace, Spring Valley, Wis., was blown in April 2.

Belmont Furnace of the Wheeling Steel & Iron Company, at Wheeling, W. Va., was blown out April 28 for relining.

Great changes are being made in the appearance of the manufacturing district of New Castle, Pa. The rod mill of the old New Castle Wire & Nail Company, which was a few years ago one of the leading mills of the city, is being torn down, and several other buildings will also be removed. The Carnegie Steel Company has been acquiring several pieces of land near its blast furnaces and steel works, and important additions will be made to the already large plant.

The No. 6 blast furnace of the Lackawanna Steel Company, Buffalo, N. Y., was blown in April 29 and made its first cast May 4. This completes the programme of blast furnace construction at the Lackawanna plant, the No. 6 furnace being the fourth of the large stacks erected there.

The Franklin Rolling Mill & Foundry Company, Franklin, Pa., will put its new mill in operation this week. The mill was built by the West Penn Foundry & Machine Company, Avonmore, Pa., and will be used for rolling concrete reinforcing bars.

C. A. Ford, Kokomo, Ind., has been appointed receiver of the Atlanta Rolling Mill & Tinplate Company, Atlanta, Ind., on the application of a stockholder who alleged that the credit of the company was exhausted and the plant was not completed. The debt is given as $51,000, of which $25,000 is in the form of a note by several stockholders for material. A mortgage of $25,000 is held by the Rev. W. D. Parr of Kokomo. The plant represents an investment of $350,000. It is stated that $25,000 to $30,000 more is needed to complete the mill and supply capital for operating expenses at the start. The company was organized four years ago with $250,000 capital stock, most of it paid in. Three large buildings were erected and most of the machinery required is in position. The petition for a receiver asked that the plant be sold and the proceeds applied on the company's indebtedness.

The report that the Carnegie Steel Company will build more finishing mills at the Clairton works is officially denied. No more additions or improvements are contemplated at this plant during this year.

We are officially advised that the report that the Youngstown Sheet & Tube Company, Youngstown, Ohio, will build two large blast furnaces at Struthers to furnish pig iron for the new Bessemer steel plant is untrue. It owns a blast furnace at Sharpsville, but at present has no intention of building new blast furnaces at Youngstown or Struthers. Arrangements have been made with furnaces in the Youngstown district for pig iron to be used in the new steel plant. It is possible, however, that after the Bessemer steel plant has been started the question of building two or three blast furnaces will be taken up.

The American Furnace & Machine Company, engineer and contractor, Publication Building, Pittsburgh, has received a contract from the United Steel Company, Canton, Ohio, for the building of one 40-ton open hearth furnace and one four-hole soaking pit.

General Machinery.

The Crescent Machine Company, Leetonia, Ohio, manufacturer of wood working machinery, has recently put on the market an angle band saw for which it is receiving numerous inquiries and is now nearly three weeks behind on its orders.

The Northern Engineering Works, crane builders, Detroit, Mich., has recently installed in the new foundry of the Russel Wheel & Foundry Company, Detroit, one 20-ton and one 10-ton electric traveling crane, each of 50 feet span.

The Ætna Foundry & Machine Company, Springfield, Ill., has not yet decided upon plans for rebuilding its plant, which was recently destroyed by fire. Very little new machinery will be required, as the principal loss was on the building, which was frame and which will probably be rebuilt of brick.

The Fredonia Iron Works, Fredonia, Kan., have been opened up anew for all kinds of machine work by the present proprietors, Griffin & Meek.

On account of the continued expansion of its business the Alton Machine Company, New York, has found it necessary to install a number of new machine tools in its factory at Harrison, N. J. These new tools are all especially adapted to the company's work, which is the manufacture of wire, cabling, stranding, insulating and rubber machinery.

The Brooks Works of the American Locomotive Company, Dunkirk, N. Y., has received an order for 15 locomotives for the Nickel Plate, ten of them consolidation freight and five for fast passenger service; also an order from the Buffalo, Rochester & Pittsburgh Railroad for six consolidation freight locomotives.

The largest order for grain milling machinery ever placed in the United States at one time was received by the Invincible Works, Silver Creek, N. Y., on May 5 from the H.-O. Company. The order was for 131 machines, to be distributed in the H.-O. mills throughout the country, the largest shipment going to the new mill of the company at Cedar Rapids, Iowa.

The Canners' Engineering Company has been incorporated at Buffalo, N. Y., to manufacture machinery and supplies for canners. Capital stock is $50,000. Incorporators are W. B. Phinney, Westfield, N. Y.; R. J. Quale, Silver Creek, N. Y., and H. W. Allen, Buffalo.

The Wayne Gear Company has been incorporated at Fort Wayne, Ind., to manufacture transmitting machinery. The capital stock is $10,000. The directors are Maurice I. Rosenthal, Joseph Freiburger and Wm. H. Olds.

The Slawson-Graham Company, engineer and contractor, with offices at 246 Greenwich street, New York, has been incorporated to do general contracting and machine work and will manufacture as specialties the Bown elevator signal and the S-G damper regulator. The company is taking up an existing plant, and its officers are J. W. Slawson, president; J. Monroe Graham, treasurer, and H. J. Atticks, secretary.

Power Plant Equipment.

Among orders recently filled by the Shephard Engineering Company, Franklin, Pa., was one for a 200 horse-power compound Shephard engine for the Llanos d'Oro Mining & Milling Company, Santa Anna, Mexico, and a 1200 horse-power cross compound engine for Chicago's lighting plant.

The General Electric Company, Schenectady, N. Y., received a contract for two 3-phase 60-cycle generators, one of 200-kw. and the other of 75-kw. capacity, from the Beatrice Electric Company, Beatrice, Neb.

The Canton Pump Company, Canton, Ohio, manufacturer of steam pumping machinery, has received an order from its San Francisco representative for a carload of pumps for use in the stricken city. This company also reports receiving large export orders from Japan and India, through its New York branch, and that it will move into a new office about May 10.

The Lozier Engine Company has moved its Buffalo offices and showrooms to 190 Main street, where commodious quarters have been fitted up with a notable display of various types of gas and gasoline engines, including heavy manufacturing engines, portable outfits, special electric lighting types and engines for farm work. Over 500 Lozier engines are now in operation in Buffalo alone.

The Locke Regulator Company, Salem, Mass., manufacturer of the Locke independent engine stop, which has been accepted by the United States Government engineers, has received an order from the Interstate Railways Company of Philadelphia, Pa., to equip the first of its engines. The latter company controls 17 plants, and recently had a $25,000 fly wheel explosion at the power station of the Chester Traction Company in South Philadelphia. The Locke Company is also about to protect six mills for the American Thread Company.

The Westinghouse Machine Company, East Pittsburgh, took a larger number of orders in April than for any previous April in the history of the company, the business aggregating about $800,000. Most of the orders included Westinghouse-Parsons steam turbines and Westinghouse gas engines. Among these were an 1100 horse-power turbine for the East St. Louis plant of the Pittsburgh Reduction Company; 3750 horse-power turbine, Lackawanna & Wyoming Valley Railroad; two turbine units of 3750 horse-power and 1500 horse-power, Mahoning & Shenango Railway & Light Company, which is constructing a power house for the operation of an electric railroad between Youngstown, Ohio, and New Castle, Pa. The electrical machinery for this road is being constructed by the Westinghouse Company. Another steam turbine order was from Portsmouth, Ohio, which called for two 600 horse-power units, and one from the Rhodes Mfg. Company, Lincolnton, N. C., for 450 horse-power. The Portsmouth order is of significance owing to the fact that the company installed two similar machines a couple of years ago.

Foundries.

A reorganization of the Lufkin Foundry & Machine Company, Lufkin, Texas, has been effected and the capital stock increased from $30,000 to $60,000. The present officers of the company are J. H. Jurth, president; G. S. Prestridge, vice-president; W. C. Trout, secretary and manager; W. H. Perkins, treasurer. The company does a general foundry and machine business and also builds saw mill machinery and logging cars. A supply department is also conducted in connection with the business. Employment is given to about 140 men.

The Scullin-Gallagher Iron & Steel Company, St. Louis, Mo., has received an order for 7500 cast steel bolsters to be used in the construction of 3250 cars, contract for which was placed with the American Car & Foundry Company.

The Sheffield Cast Iron Pipe & Foundry, Sheffield, Ala., expects to have its works completed and ready to start operating by June 1.

Bridges and Buildings.

The Ornamental Iron Work Company recently incorporated at Akron, Ohio, with F. Zindle, president; H. G. Brandon, vice-president, and W. A. Boesche, secretary-treasurer, has a plant at 80 East South street, and is manufacturing structural iron work, bank and office railings, stairs, fire escapes, joist hangers, &c.

The Michelmann Steel Construction Company is the style of what has heretofore been known as the Michelmann Boiler Company, Quincy, Ill. The name has been changed in view of the growth of the business, which now embraces nearly every branch of iron and steel construction, including boiler, tank, plate and structural work.

The Kellogg Iron Works, Buffalo, N. Y., intends to build only a portion of the new plant laid out at the present, and now has in course of construction a building, 50 x 300 feet, which will be used as a beam yard and will have a crane way 50 x 400 feet. A small power plant for operating the shears and punches for getting out plain beam work will be installed. All the new machinery has been purchased.

Fires.

The plant of the Michigan Pipe Company, Bay City, Mich., was recently destroyed by fire. The loss is about $40,000.

The Atlas Engine Works, Indianapolis, Ind., suffered a small loss, estimated at $5000, in the San Francisco fire, in the destruction of stock carried in the agency of Henshaw, Bulkley & Belcher.

Hardware.

The Montana Sheet Metal Mfg. Company, Helena, Mont., has been incorporated with a capital stock of $100,000 by Joseph A. Widmer, C. Dupre, A. P. Heywood, C. M. Batch and John Bahnsen. The company will manufacture a patent dust pan, the invention of Mr. Widmer. The principal feature of the dust pan is that it has a removable cover arranged to prevent the scattering of the dust in the pan by air currents, and further made in such a way that dust or sweepings may be gathered while the cover is in either open or closed position.

The C. W. Lasher Mfg. Company, Davenport, Iowa, has been incorporated with a capital stock of $20,000, and the style of the concern has been changed to the Lasher Mfg. Company, Incorporated. The company will manufacture sheet metal specialties and tinware. The officers are as follows: President, Chas. W. Lasher, Jr.; vice-president, Abe Levy; secretary and treasurer, Louis G. Lasher.

The Detroit Wire & Iron Works, Detroit, Mich., has been incorporated with a capital stock of $10,000 to manufacture wire cloth, wire goods and wire work of every description. The officers are T. L. Smith, president and general manager; J. H. Gregg, vice-president; James I. Krauss, secretary and treasurer.

The Anderson Tool Company, Anderson, Ind., which was recently reorganized, has added several new lines of manufacture, including a sanitary butter former, self computing butter machine, aluminum scoop and a putty knife. The company has built a large addition to its factory. The officers are J. A. Van Osdal, president; R. D. Emanuel, secretary, and E. G. Wilcox, treasurer.

Miscellaneous.

Fred. R. Bachler, San Francisco, Cal., whose brick plant was destroyed in the recent fire, has placed an order with the Anderson Foundry & Machine Works, Anderson, Ind., for equipment for a new $150,000 brick plant. It will be a six-press plant with a guaranteed capacity of 10,000 brick per hour.

N. L. C. Kachelmacher, president of the Columbus & Hocking Coal & Iron Company, Columbus, Ohio, and others have completed the organization of a $1,000,000 company which is to build a plant with a capacity of 500,000 bricks a day. The company has a number of sites in view and the selection depends largely upon what arrangements can be made with the railroads. The Engineers are now preparing plans, and it is expected that ground will be broken as soon as the site is secured.

The American Valve Company has been incorporated at Coxsackie, N. Y., to manufacture valves, &c. Capital stock is $150,000. Incorporators are D. G. Greene, O. L. Whitemen and E. R. Hotaling, Coxsackie.

The Stanley-G. I. Electric Mfg. Company's temporary headquarters at Oakland, Cal., have been moved to 67 Blake Block.

The National Drill Company, Cambridge City, Ind., is rapidly extending its trade. It recently shipped a carload of drills to an implement house at Buenos Ayres, South America. It has already entered England, Australia and Africa with its products.

The patents and machinery owned by the Hull Fire Escape Company, Connersville, Ind., have been sold to J. W. Hull, Sr., R. C. Grant and E. G. McCardell of Zion City, Ill. A factory will be erected there.

The Commercial Club of Washington, Ind., has closed contracts for the removal of the Hambrick Motor Car Company from Huntington, W. Va., to Washington. The contract provides for the erection of a plant to cost $135,000.

The Standard Metal Company has been incorporated at Indianapolis, Ind., with $100,000 capital stock, to conduct a jobbing business in tin plate, sheet iron and metals. The officers of the company are: President, Wm. L. Elder; vice-president, Wm. M. Husbands; secretary-treasurer, F. A. Wilkening.

The new plant of the Electric Cable Company was formally opened at Bridgeport, Conn., on the afternoon of April 16. The new building is a one-story brick structure 62 x 230 feet on the corner of Crescent and Central avenues. Space is provided for 300 employees and 30 machines. The plant is equipped with a traveling crane which carries the finished product to a platform erected on the north side of the building. From there the products will be loaded on the cars, which will be run from the main line of the New York, New Haven & Hartford Railroad over a private siding. It is the intention of the company to erect further buildings on the large plot of ground at the west of the present plant. The Electric Cable Company was incorporated in January of this year with a paid up capital of $500,000, which in the near future will be increased to $1,000,000. Its products include Voltax, the new insulating compound which is taking the place of rubber for magnet wire, field and armature coils and soldered mesh rail bonds. Large orders have already been received from the Interborough Company of New York, Brooklyn Rapid Transit Company and other large concerns.

The Sattley Stacker Company, Indianapolis, Ind., manufacturer of the Rogers belt punch, is meeting with success in the introduction of this handy little tool, over 10,000 being shipped out during the month of March throughout the United States, as well as abroad, such as Sweden, South Africa and Australia.

The Henry Sanders Company, manufacturer of porch and interior columns and porch material, Chicago, will build a new plant. The company has leased property fronting 300 feet on Elston avenue and running back 550 feet on Webster avenue to the Chicago & Northwestern Railroad tracks. On this site the company will erect a two-story building, 80 x 284 feet, and additional power house, dry kilns and a special building for the installation of a log and lumber saw mill. The company is in the market for a sprinkling system, freight elevator and plumbing. Most of the power equipment has been purchased.

H. A. Donalds, formerly at 161 Mulberry street, New York, will take charge of the space band business of the Scott Shoe Machinery Company at 46 Lexington avenue, Brooklyn, where all space bands should be sent for repairs.

The Robert Rom Company, Milwaukee, Wis., manufacturer of steam, water and gas supplies, will rebuild its warehouses which were recently destroyed by fire. No damage was done to the pipe shop and fitting room.

J. F. Brown, W. E. Seiger and F. T. Thompson, all of Pittsburgh, Pa., have organized the Pennsylvania Bed Company, with a capital stock of $125,000, and will erect a plant at Thirty-fifth and Smallman streets, Pittsburgh, covering a plot 120 x 168 feet. The company expects to begin operations about July 1 and will manufacture a full line of spring beds and iron bedsteads.

The recent fire at the carriage manufactory of Hincks & Johnson, Bridgeport, Conn., simply burned out a good part of the body shop and the paint loft over it. None of the other departments of the plant were damaged and all are in operation except the body shop, in which there will be a delay of not more than three or four weeks. The firm has plenty of stock on hand and is now in a position to fill orders without delay.

The property of the International Power Vehicle Company, New York, will be sold at auction on May 28.

The American Steel Spring & Tire Company, Depew, N. Y., has decided to further enlarge its plant this summer, making the third addition to the original plant necessitated by the company's growing business.

The erection of three new coal storage floors, each of 35,000 tons capacity will be started at the coal storage yards of the Susquehanna Coal Company at McClellan, near Harrisburg, Pa., within a short time by the Dodge Coal Storage Company, Philadelphia. The yard is one of the largest in the State.

The Durolithic Company, North Tonawanda, N. Y., has been awarded the contract for constructing a factory building, 110 x 320 feet, and power house, 40 x 80 feet, for the Welch Grape Juice Company, Westfield, N. Y.

The George N. Pierce Company, manufacturer of automobiles, Buffalo, N. Y., has broken ground for the construction of its extensive new plant, which will be one of the largest and most modernly equipped automobile manufacturing plants in America. It is located on the New York Central belt line at Elmwood avenue, the site having a frontage of 1000 feet on the belt line and 600 feet on Elmwood avenue. The buildings are to be of reinforced concrete and hollow tile construction, thoroughly fireproof and comprise a manufacturing building, 205 x 400 feet, one story, with sawtooth roof; assembling shop, 122 x 400 feet, one story, with sawtooth roof; manufactured stock store room, between the manufacturing and assembling buildings; two buildings, each 60 x 325 feet, two stories, in which the body factory will be located; building, 55 x 450 feet, one story, with sawtooth roof, alongside of the belt line tracks, which will contain the brazing and tin shops, sand blast room, case hardening department, nickel plating department and receiving department; a shipping and garage building, 55 x 140 feet; also alongside of the railroad tracks, power house, facing

the railroad, and a general office building, located on Elmwood avenue, 60 x 140 feet, three stories, also of reinforced concrete. On the first or semibasement of this building will be located the lockers, lavatories, bathrooms, &c., for the employees; on the second floor the general offices and drafting rooms, and on the top floor, dining rooms, kitchen, reading and club rooms for the use of the employees. A large amount of machinery will be installed in the new plant, all to be electric driven. The assembling building will be equipped with an electric traveling crane of 60 feet span. The Trussed Concrete Steel Company, Detroit, has the contract for the erection of the buildings. The company's old plant on Hanover street will be utilized for the manufacture of bicycles.

Among recent purchasers of the White Star oil filters, made by the Pittsburgh Gage & Supply Company, Chicago, are: Sears, Roebuck Company, Chicago; Mandel Bros., Chicago; American Steel & Wire Company, Waukegan, Ill.; Youngstown Sheet & Tube Company, Youngstown, Ohio; Boston Elevated Railway Company, Boston, Mass.; Merchants' Ice & Coal Company, St. Louis, Mo.; City Electric Light Plant, Easton, Penn.; Utica Industrial Company, Rome, N. Y.; Northern Mfg. Co., Detroit, Mich.; Mutual Light & Water Co., Brunswick, Ga.; Indiana County Gas Co., Indiana, Pa.; Elk Lick Lubricator Company, Hambleton, W. Va., and New England Cotton Yarn Company, New Bedford, Mass.

The Pittsburgh Metal Brazing Company, Bessemer Building, Pittsburgh, has recently put its plant in operation. The company was organized for the purpose of brazing cast iron, steel and other metals and intends making a specialty of brazing and repairing all kinds of castings and machinery. The officers are: J. Thompson Miller, president and general manager, and John F. Hinckley, secretary and treasurer.

The Eureka Packing Company, sales department, has been incorporated to market the Eureka packing made by the Eureka Packing Company, 204 Fulton street, New York. The new company was organized to separate the packing business from the specialty department. No change will be made in the plant or management.

PERSONAL.

John J. Howard, formerly superintendent of the Pulaski Iron Company, Pulaski, Va., has taken charge of the plant of the Ivanhoe Furnace Company, Ivanhoe, Va.

Prof. William D. Pence has been elected to the chair of civil engineering at the University of Wisconsin, Madison, Wis., succeeding Prof. W. D. Taylor, who has become chief engineer of the Chicago & Alton Railway.

Horace V. Winchell has resigned as chief geologist of the Amalgamated Copper Company, at Butte, Mont. He goes to St. Paul, Minn., having accepted the position of geologist of the Great Northern Railway Company, with which he was formerly associated in the same capacity, with jurisdiction over the Mesaba iron mines of that company. Mr. Winchell was Assistant State Geologist of Minnesota for several years and did important work in connection with early development on the Mesaba range.

Eugene N. Foss, the New England manufacturer and leader in the cause of reciprocity and tariff revision, is in Europe, having sailed in March. He has gone abroad partly for rest, but particularly to meet some of the leading statesmen and merchants of England and the Continent in connection with his studies of certain economic questions in their relation to the foreign trade of the United States.

J. W. Duntley, president of the Chicago Pneumatic Tool Company, sailed for Europe May 3 in the interest of the company's business. Conditions in Europe are improving rapidly, and many large contracts which have been pending are ready to be closed, hence the desire of foreign connections as well as the company's direct representatives for Mr. Duntley's presence at this time. Several contracts are to be awarded the Consolidated Pneumatic Tool Company, Limited, London, the foreign branch of the Chicago Company, for extensive installations, as well as future requirements extending over periods from one to three years.

Heinrich J. Freyn resigned his position as engineer of the gas engine department of the Wellman-Seaver-Morgan Company, Cleveland, Ohio, and has accepted a position with the Illinois Steel Company at South Chicago, Ill.

Graham Smith, formerly in charge of Westinghouse exposition and convention publicity, as the New York Westinghouse press representative, and recently engaged in advertising work under his own name, will sail next week for a journalistic tour of several months abroad. On his return he will assume the direction of the Eastern advertising interests of several prominent corporations, with an office in the Flatiron Building, New York, and will make a specialty of the preparation of industrial books of the higher class.

Allan F. McIntyre, Monadnock Block, Chicago, has been appointed Western manager for the Shenango Iron & Steel Company, Pittsburgh, maker of bar iron, skelp, universal plates, &c.

Through Prof. H. M. Howe, Sir Hugh Bell and Charles Lowthian Bell have sent to personal friends a very handsome portrait of their father, the late Sir Lowthian Bell. The portrait is reproduced from a painting by Frank Bramley, presented to the shareholders of the North Eastern Railway Company by the directors of the company.

The officials of the National Tube Company, Pittsburgh, are now making the regular semiannual inspection of plants in the Central West. In the party are W. B. Schiller, president; Edward Worcester, first vice-president; J. D. Culbertson, second vice-president; Taylor Allderdice, third vice-president; J. F. Townsend, traffic manager; Peter Boyd, general superintendent; P. C. Patterson, mechanical engineer, and Max Suppes, manager of Lorain department.

Wm. Clegg, Jr., who has been special agent of the Westinghouse Electric & Mfg. Company in St. Louis territory, has just received the appointment of acting manager of the St. Louis office. D. E. Webster, formerly manager of the office, has been transferred to a position in the Chicago sales office of the company. J. S. Tritle has been appointed acting manager of the new district office opened by the company in rooms 512 and 513, New England Building, Kansas City, Mo. He was formerly connected with the St. Louis office.

OBITUARY.

WILLIAM E. NEWHALL, treasurer of R. D. Wood & Co., Philadelphia, died May 1 of injuries received from falling through an unprotected manhole in a pavement the previous evening. He was 71 years of age and is survived by a widow, son and daughter.

ADOLPH LEITELT, JR., president of the Adolph Leitelt Iron Works, Grand Rapids, Mich., died recently at the age of 46 years, as a result of a complication of diseases. Mr. Leitelt spent two years at the Massachusetts Institute of Technology, following which he joined his father, founder and proprietor of the Leitelt Iron Works. Since the death of the elder Mr. Leitelt, in 1897, he had been president and manager of the business.

HENRY C. WILLIAMSON, mechanical superintendent and engineer of the Haskell & Barker Car Works, Michigan City, Ind., died suddenly of paralysis, April 29. He was 70 years old and had been in the company's employ 36 years. He devised several patented appliances used in the equipment and construction of cars.

HENRY H. ADAMS of H. H. Adams & Co., New York, died at his residence, at Greenwich, Conn., May 7, as the result of an operation for the removal of his leg. He was born in East Cleveland, Ohio, in 1844, and was educated in the district schools and at Shaw Academy. He served throughout the Civil War, and was captured and spent three months in a Confederate prison, being released in 1864. After the war he entered the iron and steel business and was president of the Old Sterling Iron & Mining Company, Algonquin Copper Company, Adams Gold & Silver Mining Company, Riverside Water Company of Connecticut, Adams Crucible Steel Company, and interested in many minor companies. He removed from Cleveland to New York in 1886. Mr. Adams was a colonel in the old National Guard of Connecticut, was vice-president of the Patriotic League of America and a member of the Chamber of Commerce of New York, the Union League, Lotos and Lawyers' clubs of New York and the Colonial and Army and Navy clubs of Hartford, Conn.

The Iron and Metal Trades

April production of Anthracite and Coke Iron was not as heavy as it was in March. It amounted to 2,073,645 gross tons, of which the Steel companies made 1,333,591 tons. This compares with 2,165,632 tons and 1,400,395 tons, respectively, in March. The furnaces are running along at the rate of 484,000 tons a week.

The output of the Anthracite furnaces was somewhat interfered with, but, as we have fully explained, hard coal plays so unimportant a part in the Iron industry that the stoppage of the mines is only slightly felt. The resumption of work at the Anthracite collieries will not appreciably affect the supply of Iron and will have as little effect in causing a weakening in prices as did the cessation of work tend to strengthen values.

There has been a further moderate reduction in the stocks at the Southern blast furnaces, thus showing how thoroughly the Iron made in that section is being absorbed. Some Northern districts show modest accumulations.

The markets for Foundry Pig Iron as a whole are rather quiet, with an easier tendency in some localities. Milwaukee, an important consuming center, is in the throes of a molders' strike and there are similar labor troubles in other foundry centers.

In Steel making Irons there has been further activity. The Republic Company has bought fully 20,000 tons of Bessemer Pig in the Valleys, and in the same district considerable purchases of Basic Pig have been made. In the East one works in the Philadelphia district purchased 10,000 tons at $17.50, delivered.

In the Chicago market 10,000 tons of Malleable Bessemer have been taken, but in the East a leading buyer has withdrawn without closing.

The Cast Iron Pipe foundries continue exceedingly busy. The Philadelphia requirements for Pipe and Fittings, which are now on the market, will call for 40,000 tons. A riveted Pipe line for the Brooklyn water service will call for 10,000 tons of Steel Plates.

Pacific Coast orders for Structural Material have been very light. We cannot learn that thus far foreign mills have taken a single order. Among the contracts placed with domestic mills during the week are 5000 tons for the Bethlehem Open Hearth building, 3000 tons for the Northern Pacific Railroad and 6000 tons for a building in New Orleans.

Further Rail orders for 1907 delivery are looming up. The Pennsylvania inquiry is for 180,000 tons, and two Western roads are in the Chicago market for an aggregate of 70,000 tons.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	May 9, 1906.	May 2, 1906.	Apr. 11, 1906.	May 8, 1905.
PIG IRON, Per Gross Ton:				
Foundry No. 2, Standard, Philadelphia	$18.50	$18.50	$18.50	$17.50
Foundry No. 2 Southern, Cincinnati	**16.75**	16.75	16.50	16.25
Foundry No. 2, Local, Chicago	*18.50*	18.75	18.75	17.50
Bessemer, Pittsburgh	18.10	18.10	18.10	16.35
Gray Forge, Pittsburgh	*16.50*	16.60	16.60	16.00
Lake Superior Charcoal, Chicago	*19.00*	19.25	19.50	18.50
BILLETS, RAILS, &c., Per Gross Ton:				
Bessemer Billets, Pittsburgh	27.00	27.00	27.00	24.00
Forging Billets, Pittsburgh	32.00	32.00	32.00	26.00
Open Hearth Billets, Phila	29.00	29.00	29.00	29.00
Wire Rods, Pittsburgh	34.00	34.50	34.00	31.50
Steel Rails, Heavy, Eastern Mill	28.00	28.00	28.00	28.00
OLD MATERIAL, Per Gross Ton:				
O. Steel Rails, Chicago	**14.00**	14.00	13.50	14.50
O Steel Rails, Philadelphia	*16.50*	17.25	17.00	18.00
O. Iron Rails, Chicago	**21.25**	21.25	20.50	19.50
O. Iron Rails, Philadelphia	*21.00*	21.50	21.50	23.00
O. Car Wheels, Chicago	19.00	19.00	19.00	15.75
O. Car Wheels, Philadelphia	16.75	16.75	16.75	16.00
Heavy Steel Scrap, Pittsburgh	**15.00**	15.00	14.50	16.00
Heavy Steel Scrap, Chicago	13.50	13.50	13.50	14.50
FINISHED IRON AND STEEL, Per Pound:	Cents.	Cents.	Cents.	Cents.
Refined Iron Bars, Philadelphia	1.63½	1.63½	1.63½	1.67½
Common Iron Bars, Chicago	1.66½	1.66½	1.66½	1.60
Common Iron Bars, Pittsburgh	*1.50*	1.50	1.60	1.65
Steel Bars, Tidewater, New York	1.64½	1.64½	1.64½	1.64½
Steel Bars, Pittsburgh	1.50	1.50	1.50	1.50
Tank Plates, Tidewater, New York	1.74½	1.74½	1.74½	1.74½
Tank Plates, Pittsburgh	1.60	1.60	1.60	1.60
Beams, Tidewater, New York	1.84½	1.84½	1.84½	1.74½
Beams, Pittsburgh	1.70	1.70	1.70	1.60
Angles, Tidewater, New York	1.84½	1.84½	1.84½	1.74½
Angles, Pittsburgh	1.70	1.70	1.70	1.60
Skelp, Grooved Steel, Pittsburgh	1.57½	1.57½	1.57½	1.65
Skelp, Sheared Steel, Pittsburgh	1.60	1.60	1.60	1.70
SHEETS, NAILS AND WIRE, Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, No. 27, Pittsburgh	2.25	2.25	2.25	2.20
Wire Nails, Pittsburgh	1.85	1.85	1.85	1.80
Cut Nails, Pittsburgh	1.80	1.80	1.80	1.80
Barb Wire, Galv., Pittsburgh	2.30	2.30	2.30	2.25
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Copper, New York	18.62½	18.62½	18.62½	15.25
Spelter, St. Louis	5.90	5.95	5.90	6.15
Lead, New York	**5.87½**	5.60	5.35	4.45
Lead, St. Louis	**5.72½**	5.60	5.25	4.35
Tin, New York	**43.50**	40.00	38.55	28.50
Antimony, Hallett, New York	**24.50**	22.00	19.50	7.87½
Nickel, New York	40.00	40.00	40.00	38.00
Tin Plate, Domestic, Bessemer, 100 pounds, New York	$3.79	$3.79	$3.79	$3.74

Chicago.

FISHER BUILDING, May 9, 1906.—(*By Telegraph.*)

Continued interest is manifested by Western consumers in future purchases of Pig Iron, although the tonnage booked during the week was comparatively light, on account of the disturbing factors that have entered into the situation. The molders' strike has closed 25 of the 27 foundries in Milwaukee, and while practically all of the local jobbing shops have signed the scale, fully 25 per cent. of the foundries in this city are idle. Ohio furnaces are making low prices that Northern producers are compelled to meet to hold their tonnage, and concessions on Southern grades are being named. Lake Superior Charcoal Iron has also declined and is quoted at $19, Chicago, and in view of the general unsettled condition of the market, action on many inquiries is being deferred. The longshoremen's strike has not interfered with the unloading of ore cargoes at Chicago and Milwaukee, and stocks will carry the furnaces well into the summer months. The inquiry for 75,000 tons of Charcoal and Malleable Bessemer Pig Iron, for delivery during a period of five years, has not yet been acted upon, several merchant furnace interests being disinclined to sell so far ahead. Western railroads have already contracted for over 200,000 tons of rails for 1907 delivery, and two inquiries just received specify 70,000 tons for next year's shipment. Light Rails for summer delivery are also in good demand, heavy purchases having been made by Southern lumber interests. With only a few exceptions, implement makers have contracted for the special shapes for shipments during the year beginning July 1, and the tonnage shows an average increase of 25 per cent. over previous requirements. Steel Bar consumers outside of the implement trade steadfastly refuse to buy on the present basis and insist on the same

concessions granted the makers of agricultural tools. Prevailing quotations on Iron Bars were reaffirmed at a meeting of the Western Association, held last week.

Pig Iron.—Malleable Iron purchases aggregated 10,000 tons during the week, including one lot of 3000 and another of 4000 tons. Numerous inquiries are still under consideration, but will not be acted upon until after the meeting of the Malleable foundries, which is being held here to-day. The Pullman Company purchased 3000 tons of Southern Iron on a basis below $14, Birmingham, for No. 2, and concessions of 25c. a ton are frequent, but are confined to interests not in the agreement to maintain a price at $14. On Malleable Iron Ohio furnaces continue to quote $18.30, Chicago, and are taking considerable tonnage. Lake Superior Charcoal has declined to $19, Chicago, although stacks outside of the association are asking an advance of 25c. to 50c. a ton. Prevailing quotations, f.o.b. Chicago, are as follows:

Lake Superior Charcoal	$19.00 to $19.50
Northern Coke Foundry, No. 1	19.00 to 19.50
Northern Coke Foundry, No. 2	18.50 to 18.75
Northern Coke Foundry, No. 3	18.00 to 18.25
Northern Scotch, No. 1	19.50 to 19.75
Ohio Strong Softeners, No. 1	19.30 to 19.55
Ohio Strong Softeners, No. 2	18.80 to 19.05
Southern Coke, No. 1	18.25 to 18.40
Southern Coke, No. 2	17.65 to 17.90
Southern Coke, No. 3	17.15 to 17.40
Southern Coke, No. 4	16.65 to 16.90
Southern Coke, No. 1 Soft	18.15 to 18.40
Southern Coke, No. 2 Soft	17.65 to 17.90
Southern Gray Forge and Mottled	16.15 to 16.40
Malleable Bessemer	18.30 to 18.55
Standard Bessemer	19.30 to 19.55
Jackson Co. and Kentucky Silvery, 6 %	20.30 to 20.80
Jackson Co. and Kentucky Silvery, 8 %	21.30 to 21.80
Jackson Co. and Kentucky Silvery, 10 %	23.30 to 23.80

Metals.—Considerable excitement prevails in the market for Tin and Antimony. Speculation is rife and prices have advanced 3c. on the former to 7c. on the latter. In fact Antimony is almost unobtainable at any price, and where offered goes at the terms of the seller. In Copper the steady demand continues, but leading interests in the market are endeavoring not to allow prices to go above the present high basis, fearing a runaway market in this commodity also. We quote: Casting Copper, 18½c. to 18¾c.; Lake, 18¾c. to 19c., in car lots; small lots, ¼c. to ⅜c. higher; Pig Tin, car lots, 44½c. to 45c.; small lots, 46c. to 47c.; Spelter, prompt delivery, 6.20c. to 6.35c., for car lots; Lead, Desilverized, 5.80c. to 6.05c., for 50-ton lots; Corroding, 6.35c. to 6.60c., for 50-ton lots; on car lots, 2¼c. per 100 lbs. higher; Cookson's Antimony, 30c., and other grades, 28c. to 29c.; Sheet Zinc is $7.75 list, f.o.b. Laselle, in car lots of 600-lb. casks. On Old Metals we quote: Copper Wire, 16¾c.; Heavy Copper, 16¼c.; Copper Bottoms, 15½c.; Copper Clips, 15¾c.; Red Brass, 15½c.; Red Brass Borings, 13¾c.; Yellow Brass, 12¼c.; Yellow Brass Borings, 10¼c.; Light Brass, 8¾c.; Lead Pipe, 4¾c.; Tea Lead, 4½c.; Zinc, 4½c.; Pewter, No. 1, 24c.; Tin Foil, 32c.; Block Tin Pipe, 27½c.

(By Mail.)

Billets.—There is little change in the Billet situation, new tonnage being limited almost entirely to Forging Billets in small lots for prompt delivery, for which the mills are asking from $34 to $35, f.o.b. Chicago. Bessemer and Basic Open Hearths Rods are quiet and are quoted at $35 and $36.

Rails and Track Supplies.—Western roads have already placed contracts with the mills for over 200,000 tons of Standard Section Rails for 1907 delivery. Two roads are now in the market for 70,000 tons and it is probable that they will place contracts this week. The Tennessee Coal, Iron & Railroad Company has almost sold up its entire tonnage for next year and all of the railroads are considering early purchases in order to secure favorable rolling allotments. The demand for Light Rails continues good and during the month of April new tonnage exceeded mill shipments. Spikes for prompt delivery are scarce and are held at 2.25c. to 2.35c., although for delivery during the last quarter only 2.10c. is asked. We revise quotations as follows: Angle Bars, accompanying Rail orders, 1906 delivery, 1.50c.; carload lots, 1.75c.; Spikes, 2.25c. to 2.35c.; Track Bolts, 2.65c. to 2.75c., base, Square Nuts, and 2.80c. to 2.90c., base, Hexagon Nuts. The store prices on Track Supplies range from 15c. to 20c. above mill prices. Light Rails, 30 to 45 lb. sections, $27 to $28; 25-lb., $29; 20-lb., $29 to $30; 16-lb., $30 to $31; 12-lb., $31 to $32, and lighter sections down to 8-lb., $38 to $40, f.o.b. mill. Standard Sections are unchanged at $28, f.o.b. mill, full freight to destination.

Structural Material.—The contract for the erection of the Maison Blanche at New Orleans was awarded to James T. Stewart & Co., and involves 6000 tons of Structural Material. The Louisville & Nashville Railroad awarded contracts for several bridges involving 11,000 tons, of which the Pennsylvania Steel Company secured a small tonnage. The strike of the structural workers has effectively tied up operations on most of the large buildings in course of erection in this city, although several of the contractors having time limit jobs have granted the demands. There is some talk of a generally sympathetic strike that will affect all of the building trades unless the demands are soon granted, but as yet none of the other crafts has gone out. Quotations are unchanged, as follows: Beams and Channels, 3 to 15 inches, inclusive, 1.86½c.; Angles, 3 to 6 inches, ¼-inch and heavier, 1.86½c.; Angles, larger than 6 inches on one or both legs, 1.96½c.; Beams, larger than 15 inches, 1.96½c.; Zees, 3 inches and over, 1.86½c.; Tees, 3 inches and over, 1.91½c., in addition to the usual extras for cutting to extra lengths, punching, coping, bending or other shop work.

Plates.—New Plate tonnage, especially on sheared, is exceedingly light, and Western mills are well up on specifications. One of the largest Eastern mills, however, is not in position to make deliveries in less than 30 days, recent specifications from Boiler makers and Structural fitters received by it having been unusually heavy. Quotations continue to be firmly maintained, however, as follows: Tank quality, ¼-inch and heavier, wider than 6¼ and up to 100 inches wide, inclusive, car lots, Chicago, 1.76½c.; 3-16 inch, 1.86½c.; Nos. 7 and 8 gauge, 1.91½c.; No. 9, 2.01½c.; Flange quality, in widths up to 100 inches, 1.86½c., base, for ¼-inch and heavier, with the same advances for lighter weights; Sketch Plates, Tank quality, 1.86½c.; Flange quality, 1.96½c. Store prices on Plates are as follows: Tank Plate, ¼-inch and heavier, up to 72 inches wide, 2c. to 2.10c.; from 72 to 96 inches wide, 2.10c. to 2.20c.; 3-16 inch up to 60 inches wide, 2.10c. to 2.20c.; 72 inches wide, 2.35c. to 2.45c.; No. 8, up to 60 inches wide, 2.15c. to 2.25c.; Flange and Head quality, 25c. extra.

Sheets.—The Sheet market continues firm, and while no price changes have been made concessions generally have been withdrawn. Stocks of Galvanized Sheets, 26 and 27 gauge, have been practically depleted on account of the heavy demand from San Francisco. This material is to be used in the erection of temporary structures. We quote as follows: Blue Annealed, Nos. 9 and 10, 1.86½c. to 1.91½c.; Nos. 16 and 17, 2.06½c. to 2.11½c.; Box Annealed, Nos. 18 to 20, 2.26½c. to 2.31½c.; No. 27, 2.46½c. to 2.51½c.; No. 28, 2.56½c. to 2.61½c.; Galvanized Sheets, Nos. 10 to 14, 2.61½c.; Nos. 17 to 21, 2.86½c.; Nos. 22 to 24. 3.01½c.; Nos. 25 and 26, 3.21½c.; No. 27, 3.41½c.; No. 28, 3.61½c.; No. 30, 4.11½c. Sheets from store: Blue Annealed, Nos. 10 and 11, 2.10c. to 2.20c.; Nos. 12 and 13, 2.15c. to 2.25c.; Nos. 14 and 15, 2.20c. to 2.30c.; No. 16, 2.30c. to 2.40c. Box Annealed: Nos. 18 to 20, 2.50c. to 2.55c.; Nos. 22 to 24, 2.55c. to 2.60c.; No. 26, 2.60c. to 2.65c.; No. 27, 2.65c. to 2.70c.; No. 28, 2.75c. to 2.80c.; No. 30, 3.15c. to 3.20c. Galvanized from store: Nos. 10 to 20, 3c. to 3.05c.; Nos. 22 to 24, 3.15c. to 3.20c.; No. 26, 3.35c. to 3.40c.; No. 27, 3.55c. to 3.60c.; No. 28, 3.75c. to 3.80c.; No. 30, 4.95c. to 5c.

Bars.—The Steel Bar situation is practically without change. Large concerns outside of the implement trade continue to hold off and insist that unless granted a basis of 1.40c., that they will not place contracts for their future requirements. Iron Bars are moving freely, and at a meeting of the Indepedent Iron Bar Association, held here last week, prevailing prices were reaffirmed. Quotations are unchanged, as follows: Iron Bars, 1.66½c.; Steel Bars, 1.66½c.; both half extras; Hoops, 2.06½c., extras, as per Hoop card; Bands, 1.66½c., as per Steel card; Soft Steel Angles and Shapes, 1.66½c., half extras. Store prices are as follows: Bar Iron, 2.10c.; Steel Bars, 1.85c., and as high as 2c. is asked on certain scarce sizes; Steel Bands, 1.85c. to 1.90c., half extras; Soft Steel Hoops, 2.30c. to 2.40c., full extras.

Merchant Pipe.—The mills are receiving specifications very freely, owing to the tremendous building movement that is prevailing throughout the West. As most of the large distributers placed large contracts with the mills shortly before the first of the year, little new tonnage is being booked. Quotations continue low and unchanged, on the basis of 81 per cent. off the list, Pittsburgh, although official discounts on car lots, Chicago, remain as follows: Black Steel Pipe, 78.35 per cent. on the base sizes, ¾ to 6 inches, and Galvanized, 68.35 per cent. Iron Pipe is quoted from 1½ to 2 points higher. From store in small lots Chicago jobbers are quoting 76½ to 77 per cent. on Black Steel Pipe, ¾ to 6 inches.

Boiler Tubes.—An extreme basis of 70 and 5 off the list is now reported on Boiler Tubes, although 70 off is the price asked by most of the mills. Considerable business has been booked on this basis, as the selling price of Boiler Tubes is now lower than it has been at any time in the past two years. Discounts on base sizes, 2¾ to 5 inches, in car lots are as follows: Steel Tubes, 68.35; Iron, 55.35. Seamless, 50.35; 2½-inch and smaller and lengths over 18 feet, and 2½-inch and lengths over 22 feet, 10 per cent. extra. Store prices are unchanged, as follows:

	Steel.	Iron.	Seamless.
1 to 1½ inches	40	35	42½
1¾ to 2¼ inches	50	35	35
2½ inches	52½	35	30
2¾ to 5 inches	60	47½	42½
6 inches and larger	50	35	..

Cast Iron Pipe.—Three small contracts aggregating 2000 tons were placed with the United States Cast Iron Pipe & Foundry Company by Western municipalities during the week. The railroads are limiting their tonnage almost entirely to immediate requirements, not being inclined to cover

for the future on the basis now prevailing. Quotations are unchanged, as follows: Water Pipe, 4-inch, $31; 6, 8, 10 and 12 inch, $30; over 12-inch, $29, with $1 extra for Gas Pipe. Large municipal contracts are usually placed at somewhat lower basis.

Merchant Steel.—With few exceptions almost all of the Western implement manufacturers have now closed their requirements of special shapes for delivery during the year beginning July 1. Requirements are on an average 25 per cent. larger than specified in contracts now expiring, and it is estimated that the total of this material that has already been placed by these manufacturers will aggregate considerably over 50,000 tons. Quotations are firmly maintained on the following basis: Planished or Smooth Finished Tire Steel, 1.86½c.; Iron Finish up to 1½ x ½ inch, 1.81½c.; Iron Finish, 1½ x ½ inch and larger, 1.66½c., base; Channels for solid rubber tires, ¾ to 1 inch, 2.16½c., and 1⅛ inch and larger, 2.06½c.; Smooth Finished Machinery Steel, 1.91½.; Flat Sleigh Shoe, 1.71½c.; Concave and Convex Sleigh Shoe, 1.96½c.; Cutter Shoe, 2.35c.; Toe Calk Steel, 2.21½c.; Railway Spring, 1.86½c.; Crucible Tool Steel, 6½c. to 8c., and still higher prices are asked on special grades. Shafting, 50 per cent. off on car lots and 45 per cent. in less than car lots, in base territory.

Coke.—Western Coke prices show no signs of strengthening, and low prices continue to be made on consginments of both Connellsville and West Virginia grades. Seventy-two hour Connellsville Foundry Coke is quoted at $3 to $3.15 at the ovens, equivalent to $5.65 to $5.80, Chicago. Wise County Coke is held at $2.75 ovens. By-Product Coke is quoted at $5.80 and sales are limited almost entirely to lots covering immediate requirements.

Old Material.—Somewhat higher prices than those quoted below have been paid during the week for No. 1 Wrought Scrap to cover short sales, but as this material was to meet rigid specifications, the advanced quotation is readily explained. One large interest is now in the market for 1000 tons of high grade Wrought Scrap for early delivery and it is probable that a slight advance will have to be paid on this material. Railroad lists have been issued this week for the disposal of approximately 5000 tons of material by the Omaha division of the Chicago & Northwestern Railroad, the Santa Fé and the Chicago, Milwaukee & St. Paul. Quotations generally are without change. The range of prices paid by large consumers to producers and dealers, per gross ton, car lots, f.o.b. Chicago, is as follows:

Old Iron Rails	$21.25 to $21.50
Old Steel Rails, 4 feet and over	16.00 to 16.50
Old Steel Rails, less than 4 feet	14.00 to 14.50
Heavy Relaying Rails, subject to Inspection, 50 pounds and under	27.00 to 27.50
Old Car Wheels	19.00 to 19.50
Heavy Melting Steel Scrap	13.50 to 14.00
Frogs, Switches and Guards	13.50 to 14.00
Mixed Steel	12.00 to 12.50

The following quotations are per net ton:

Iron Fish Plates	$16.50 to $17.00
Iron Car Axles	22.50 to 23.00
Steel Car Axles	18.00 to 18.50
No. 1 Railroad Wrought	14.50 to 15.00
No. 2 Railroad Wrought	13.50 to 14.00
Locomotive Tires, smooth	14.00 to 14.50
Railway Springs	13.50 to 14.00
No. 1 Dealers' Forge	12.00 to 12.50
Mixed Busheling	10.00 to 10.50
Iron Axle Turnings	11.00 to 11.50
Soft Steel Axle Turnings	11.00 to 11.50
Machine Shop Turnings	11.00 to 11.50
Cast Borings	9.00 to 9.25
Mixed Borings, &c	9.00 to 9.25
No. 1 Mill	9.00 to 9.25
No. 2 Mill	8.00 to 8.25
No. 1 Boilers, cut to Sheets and Rings	9.50 to 10.00
No. 1 Cast Scrap	13.25 to 13.75
Stove Plate and Light Cast Scrap	10.50 to 11.00
Railroad Malleable	13.50 to 14.00
Agricultural Malleable	12.50 to 13.00

The Steel Supply Company and Brown & Co., 11 to 13 South Jefferson street, Chicago, have leased the four-story building at 12 to 14 South Jefferson street for an Iron and Steel warehouse and removed to the latter location May 1.

Philadelphia.

REAL ESTATE TRUST BUILDING, May 8, 1906.

Happily the coal strike is ended, and to that extent a serious menace to the interests of business has been removed. But this by no means ends all the difficulties, and it will require weeks before the situation is fully developed. In the first place, it will involve a change in the cost of fuel, and it will also imply a change in the cost of Pig Iron. This, of course, is in the future, as it is hardly supposable that holders will make immediate reductions, in view of the fact that every furnace in the country is behind with deliveries. The sentimental effect is bound to be felt, however, and those who want to buy for the last half of the year are not likely to be in haste to do so as to-day's prices. The difficulty will be for makers to come down gracefully, and without going too far. At this time it is quite impossible to say what proportion the demand will bear to the supply during the remainder of the year, and that alone will be the real arbiter of prices. Naturally an unrestricted production is looked for in the near future, but if consumption should be maintained at the high limits of the past 12 months there will not be much surplus Iron, in which case prices cannot recede very far. On this point, however, the future is a sealed book. Some well informed houses take the ground that conditions are as good as they have ever been, and that the settlement of the strike removes almost the only obstacle to continued prosperity. It should be remembered, however, that the San Francisco disaster was regarded as a calamity to the whole world two or three weeks ago. Is it possible that such enormous losses and such widespread disarrangement of finances have already been fully discounted? If not, there is but little basis for expecting a further expansion in the demand for Iron and Steel during the last half of the year. This is a great country, however, and it is hard to limit its possibilities, but even the United States is not immune from disasters and changing conditions. No human foresight can correctly define the course of events during the remainder of the year, but ordinary business judgment suggests a conservative attitude until it is seen which way the cat is inclined to jump.

Pig Iron.—Up to this date prices have been strong, and seemed inclined to work higher. What effect the termination of the coal strike will have is not yet apparent. The scarcity of Iron for May and June is so great, however, that it is hardly likely that prices for deliveries for those months will be affected, nor is there any certainty that it will affect the third quarter, but with an abundance of fuel at lower prices than have prevailed thus far during the year, it is hardly conceivable that it will not have some influence on Iron sooner or later; the trade has hardly got its bearings yet, so that it would be entirely premature to take strong ground in regard to prices, particularly in view of the lake longshoremen's strike. A great deal of material is wanted, and consumption is not going to be held in abeyance until a new basis of prices is established, so that even if changes are pending business will go on just the same, and in due time prices will be adjusted to meet the changed conditions, whatever they may prove to be. Buying on a large scale is, however, not to be expected at present. Hand to mouth lots will probably be the rule until the situation is sufficiently developed to warrant extended operations. In the meanwhile about $18.75 is the best price for June and July shipments of No. 2 X Foundry, and $18.75 for Basic, but good sized lots of the latter have been sold at $17.50 for the last quarter. Low grade Foundry Irons are still wanted by the Pipe founders, with sales of such lots as can be made available at $16.25 to $17, delivered, according to what the article may be. Some business has also been done at about $19.50 for May and June Malleable Iron, but it could be bought for $19, last half of the year. Standard Bessemer has also sold at a little over $20. Prices for Philadelphia and nearby deliveries are about as follows:

No. 1 X Foundry	$19.25 to $19.50
No. 2 X Foundry	18.50 to 19.00
No. 2 Plain	18.25 to 18.50
Standard Gray Forge	16.50 to 16.75
Ordinary Gray Forge	16.00 to 16.25
Basic	17.50 to 17.75
Low Phosphorus	25.00 to 25.50
Malleable	19.25 to 19.50
Bessemer	20.00 to 20.25

Steel.—The demand continues in full force and makers have no difficulty in securing all the business they want at $29 to $29.50, delivered, for ordinary Open Hearth Steel. Forging Billets are $32 to $35.

Steel Alloys.—The arrivals are somewhat liberal, and offerings for June and July shipment indicate easier conditions in the near future. Spot Ferro could be had at less than $110; third and fourth quarters, less than $80, and Spiegel at about $36. There is very little demand, however, and prices are all more or less nominal.

Plates.—Since the announcement of settlement with the coal miners the demand for Plates has shown a marked improvement. This, however, is somewhat local, as most of the shops in the coal regions closed down while the strike was on, but they are now sending quite a nice batch of small orders and specifying freely on business that was held up. Prices are unchanged, as follows:

	Carload. Cents.	Part carload. Cents.
Tank, Bridge and Boat Steel	1.73½	1.78½
Flange or Boiler Steel	1.83½	1.88½
Marine	2.13½	2.18½
Locomotive Fire Box Steel	2.23½	2.28½

The above are base prices for ¼-inch and heavier. The following extras apply:

	Extra per 100 pounds.
3-16-inch thick	$0.10
Nos. 7 and 8, B. W. G.	.15
No. 9, B. W. G.	.25
Plates over 100 to 110 inches	.05
Plates over 110 to 115 inches	.10
Plates over 115 to 120 inches	.15
Plates over 120 to 125 inches	.25
Plates over 125 to 130 inches	.50
Plates over 130 inches	1.00

Structural Material.—There is quite an active demand for small and medium sized lots, and the local mills are doing very well. Prospects are excellent, and great activity

seems to be assured for the remainder of the year. Prices are unchanged, as follows: Beams, Channels and Angles, 1.83½c. to 2c., delivered.

Bars.—Reports are not uniformly good, although some mills note an improvement during the past week or ten days. The local demand has been stimulated by the strike settlement, and it is not unlikely that a good deal of business will be placed in the near future. Some mills give less favorable reports, however, and say that their order books would stand liberal replenishment. Prices for both Iron and Steel Bars are quoted at 1.63½c. to 1.68½c.

Sheets.—The demand is of a somewhat tantalizing character. Inquiries for large lots are made, but they seldom amount to much, although in a small way mills are kept busy on day to day orders, at about the following prices: Nos. 18 to 20, 2.40c.; Nos. 22 to 24, 2.50c.; Nos. 25 and 26, 2.60c.; No. 27, 2.70c., and No. 28, 2.80c.

Old Material.—The market is decidedly easier, and bids for large lots are hard to get, even at last week's inside prices. Consumers are evidently looking for cheaper material, in anticipation of possible reductions in finished products. The market is hard to quote with exactness, but bids and offers would be about as follows for deliveries in buyers' yards:

Scrap Steel Rails and Crops	$16.50 to $16.75
No. 1 Steel Scrap	16.25 to 16.50
Low Phosphorus Scrap	20.50 to 21.00
Old Steel Axles	19.50 to 20.00
Old Iron Axles	25.50 to 26.00
Old Iron Rails	21.00 to 21.50
Old Car Wheels	16.75 to 17.00
Choice Scrap, R. R., No. 1 Wrought	19.00 to 19.50
No. 1 Yard Scrap	17.50 to 18.00
Long and Short	16.50 to 17.00
Machinery Scrap	15.50 to 16.00
Wrought Iron Pipe	14.50 to 15.00
No. 1 Forge Fire Scrap	15.00 to 15.50
No. 2 Light Ordinary	10.50 to 11.00
Wrought Turnings	13.00 to 13.50
Axle Turnings, Choice Heavy	14.00 to 14.50
Stove Plate	11.50 to 12.00
Cast Borings	9.50 to 10.00

Cincinnati.

FIFTH AND MAIN STS., May 9, 1906.—(*By Telegraph.*)

Pig Iron.—While the undertone of the market apparently is of a very healthy nature, reports indicate that there has been quite a falling off in sales and that well defined inquiries are not coming forward with the regularity desired. There seems to be to a marked degree an absence of the heavy buying that at this season of the year is usually evident, and while some of the heavy melters are known to be feeling the market in a general way, nothing has been done that would indicate that they have fully decided to contract for the remainder of the year's supply. Northern Iron has shown more activity than Southern, and what few sales have been made were largely of the former. Prices for Northern No. 2 appear to be well established at $16 to $16.50 at furnace, with the minimum predominating. A higher schedule, however, may prevail at almost any time if the strike of the lake longshoremen is protracted to any great length, as this not only affects the unloading of vessels that arrive, but also applies to loading ore from off the dock. This may possibly necessitate the shifting of mixtures and cause some of the furnaces to shut down until settlements are reached. Southern No. 2 is apparently well established on a $13.75 to $14 Birmingham basis, with some brands from outside districts selling at 25 cents lower. As a general proposition, however, it is safe to say that no strictly Birmingham Iron can be had at a less figure than $14. Freight rates from Hanging Rock district are $1.15, and from Birmingham $3. We quote, f.o.b. Cincinnati, as follows:

Southern Coke, No. 1	$17.25 to $17.50
Southern Coke, No. 2	16.75 to 17.00
Southern Coke, No. 3	16.25 to 16.50
Southern Coke, No. 4	15.75 to 16.00
Southern Coke, No. 1 Soft	17.25 to 17.50
Southern Coke, No. 2 Soft	16.75 to 17.00
Southern Coke, Gray Forge	15.00 to 15.25
Southern Coke, Mottled	14.50 to 14.75
Ohio Silvery, No. 1 (8 per cent. Silicon)	21.65 to 22.15
Lake Superior Coke, No. 1	17.65 to 18.15
Lake Superior Coke, No. 2	17.15 to 17.65
Lake Superior Coke, No. 3	16.65 to 17.15
Car Wheel Irons.	
Standard Southern Car Wheel	$23.50 to $24.00
Lake Superior Car Wheel	22.00 to 22.50

Coke.—The market is easy and supply plentiful. Trade has been rather quiet, largely due to the heavy buying incident to the coal strike. We quote the best brand of Connellsville and Virginia Foundry from $2.75 to $3, f.o.b. ovens.

Finished Iron and Steel.—The Structural demand still continues to show great activity, and reports from all the mills show them to be booked far in advance. We quote, f.o.b. Cincinnati, as follows: Iron Bars, in carload lots, 1.63c., with half extras; the same, in smaller lots, 2c., with full extras; Steel Bars, in carload lots, 1.63c., with half extras; the same, in small lots, 1.85c., with full extras; Base Angles, 1.83c., in carload lots; Beams and Channels, in carload lots, 1.83c.; Plates, ¼-inch and heavier, 1.73c., in carload lots; in smaller lots, 1.90c.; Sheets, 16 gauge, in carload lots, 2.15c.; in smaller lots, 2.70c.; 14 gauge, in carload lots, 2.05c.; in small lots, 2.60c.; Steel Tire, 1 x ¼ inch or heavier, 1.83c., in carload lots.

Old Material.—The market is very quiet. We quote dealers' prices, f.o.b. Cincinnati, as follows: No. 1 Railroad Wrought Scrap, $15 to $15.50 per net ton; Cast Borings, $6 to $7 per net ton; Steel Turnings, $9 to $9.50 per net ton; No. 1 Cast Scrap, $12 to $13 per net ton; Iron Rails, $22 to $22.50 per gross ton; Steel Rails, rolling mill lengths, $15 to $16 per gross ton; Relaying Rails, 56 lbs. and upward, $28 to $29 per gross ton; Iron Axles, $24 to $24.50 per net ton; Car Wheels, $18.50 to $19.50 per gross ton; Low Phosphorus Scrap, $18 to $19 per gross ton.

Birmingham.

BIRMINGHAM, ALA., May 7, 1906.

Pig Iron.—Producers report that while the market is not so active as a few weeks since they are doing a satisfactory business. The three largest report their sales for April exceeded their production for the month, and that while they have booked no large tonnage so far this month they have done a steady business in small lots, and the number of inquiries being received forecast a good month's sales. Some of the large furnaces are out of the market on certain grades for the next 60 days, and the business now being booked is largely for delivery during the second half of the year. The price of $14 per ton for No. 2 Foundry, it is understood, is being strictly adhered to by all the furnaces in the district, the small operators having fallen in line with the larger producers. Many requests are still being received from melters to anticipate shipments and no stocks are accumulating.

Basic Iron is now being furnished the Southern Steel Company, whose furnaces were blown out on the 3d for repairs, by the Alabama Consolidated Coal & Iron Company from its Gadsden furnace. These plants are about 3 miles apart, and the molten Iron is being handled by special arrangement with the Southern Railroad Company. So far the experiment has been quite successful, and it is being watched with much interest by the furnacemen in the district. Some of the producers in the district have sufficient furnaces to supply a large Steel mill, but they are unfortunately located several miles apart, and for this reason it has not been deemed expedient to enter the Steel business, but should it be shown that the railroads can satisfactorily handle the molten metal, development along this line may be expected.

Steel Rails.—The Tennessee Coal, Iron & Railroad Company reports the sale of 20,000 tons this week to two railroads taking 10,000 tons each. Its output is practically booked to July, 1907, and owing to the superiority of the Open Hearth Rails it is making it has no trouble in disposing of them at an advance of $1 per ton over the price for Bessemer Steel Rails. It is expected that the improvements now in course of construction will enable the company to double its output within the next 12 months.

The Republic Iron & Steel Company is making preparations to resume operations at its two Open Hearth Steel furnaces located at the Birmingham Rolling Mills. The capacity of these furnaces is only 50 tons each per day, and they were the first used here to demonstrate that Open Hearth Steel could be made from the Iron of this district. The output will be used at the Rail mill of the Tennessee Company at Ensley.

Old Material.—While the market has not been particularly active this week dealers report a satisfactory business. Quotations are approximately as follows per gross ton, f.o.b. cars here:

Old Iron Rails	$17.75 to $18.25
Old Iron Axles	18.25 to 18.75
Old Steel Axles	16.25 to 17.25
Old Car Wheels	16.25 to 16.75
No. 1 Railroad Wrought	15.25 to 15.75
No. 2 Railroad Wrought	14.75 to 15.25
No. 1 Country Wrought	13.75 to 14.25
No. 2 Country Wrought	11.75 to 12.25
Wrought Pipes and Flues	11.75 to 12.25
Railroad Malleable	11.75 to 12.25
Mixed Steel	9.75 to 10.25
No. 1 Machinery Cast	11.25 to 11.75
Stove Plates and Light Cast	9.25 to 9.75

The Shelby Iron Company, at Shelby, Ala., announces that it will start a stack on Charcoal Iron as soon as a supply of Charcoal can be secured, which will probably require about 30 days. Of the six furnaces in Alabama arranged to make Charcoal Iron none are in blast, as on account of the growing scarcity of timber, it is almost impossible to get a steady supply of Charcoal. This grade of Iron is in great demand and is commanding fancy prices.

A. Griggs, who has been for some time superintendent of the Alabama Great Southern Railroad, with headquarters in Birmingham, has been elected to the presidency of the Alabama & Georgia Iron Company, with headquarters at Cedartown, Ga. The Alabama & Georgia Company operates a Charcoal furnace at Cedartown, and owns large tracts of valuable Ore lands, which it is understood are to be developed along extensive lines.

Pittsburgh.

PARK BUILDING, May 9, 1906.—(*By Telegraph.*)

Pig Iron.—Up to this time no definite advices have been received as to when the strike of the longshoremen at the lower lake Ore docks will probably terminate. Practically no Ore is being unloaded and it is stated that fully 1,000,000 tons are now on the boats at the different harbors waiting to be unloaded. The furnaces have been very much inconvenienced by the strike and a number of stacks that have no Bessemer Ores have been running on Basic and Malleable Bessemer. This has intensified the scarcity of Bessemer Iron and most of the furnaces are far behind in deliveries. The event of the week is the sale of 20,000 tons of standard Bessemer Pig Iron to the Republic Iron & Steel Company by the Bessemer Pig Iron Association, for May and June delivery, at $17.25, Valley furnace. The Republic Company has been very short of Bessemer Iron for some time, its blast furnace at Hazelton, Ohio, being out for repairs, and it will use this Iron at its Bessemer plant at Youngstown. We also note heavy sales of Virginia and Valley Basic Iron, large buyers being the Grand Crossing Tack Company, American Steel Foundries and other consumers. Bessemer Iron is very firm at $17.25 to $17.50, Valley furnace, while Basis is strong at $17 to $17.25, Valley furnace, and like Bessemer is scarce for May and June delivery. There is a fair inquiry for Foundry Iron in small lots, but no large inquiries are in the market. We quote Northern No. 2 Foundry at $16.50 to $16.75, Valley furnace, with some furnaces getting $17 for small lots. There is a fair inquiry for Forge Iron and we quote Northern brands at $15.65 to $15.75, Valley furnace, or $16.50 to $16.60, Pittsburgh. A sale of 300 tons is reported at the latter price.

Steel.—There is not much new inquiry for Steel, practically all consumers of Billets, Sheet and Tin Bars being covered by contracts on which the mills are very much behind in deliveries. We quote Bessemer Billets from $27 to $28, Pittsburgh. We quote Bessemer and Open Hearth Sheet and Tin Bars in random lengths at $28, Pittsburgh, with an advance of 50c. a ton for Cut Bars.

(*By Mail.*)

The strike of longshoremen at the lower lake ports has not yet been settled, but indications are that the trouble may possibly be adjusted before this week is out. The furnaces have been put to very great inconvenience by this labor trouble and have been very short of Ore. Some stacks that ordinarily run on Bessemer Iron have not been able to get standard Bessemer Ores and have been compelled to run on Basic, Malleable, Bessemer and Foundry Iron. The trouble has had the natural effect of causing a greater shortage in the supply of Bessemer Iron, which is very scarce for prompt delivery. No large sales of Bessemer have been made during the week, but it is said that the Republic Iron & Steel Company is in the market for 20,000 tons for May, June and July delivery, and that the Pennsylvania Steel Company will have to look to the Valley districts for at least a part of its Bessemer Iron. There has been a heavy tonnage of Basic Iron sold in the past two weeks, and it is firm on the basis of $17, Valley furnace. There is a moderate inquiry for Foundry Iron, but prices continue rather soft, Northern brands being held at about $16.50, Valley furnace, this price being sometimes shaded. There is not much inquiry for Forge Iron, as consumers are pretty well covered. We quote Northern brands at $15.65 to $15.75, Valley furnace, or $16.50 to $16.60, Pittsburgh. There is not much new inquiry for Steel, and prices on standard 4 x 4 inch Bessemer and Open Hearth Billets seem to be a little easier. On Slabs, Sheet and Tin Bars the mills cannot begin to supply the demand, and the Carnegie Steel Company is said to be nearly three months behind in deliveries. The demand for Rails and Finished Iron and Steel continues heavy, and some inquiries are in the market, especially for Roofing Sheets and the smaller sizes of Pipe, for San Francisco delivery. The Coke market is slightly easier on account of the settlement of the Anthracite Coal strike, while Scrap continues dull.

Ferromanganese.—Prices are easier on Ferro, and for spot delivery it can be obtained as low as $90, Pittsburgh. For extended delivery, from $75 to $80 is quoted. It is reported that a local Steel interest which is a very large consumer has recently bought about 2500 tons for extended delivery, on the basis of about $70, Pittsburgh.

Muck Bar.—We do not hear of any inquiries, and prices seem to be a little easier. We quote best grades of Muck Bar made from all Pig Iron at $28 to $28.50, Pittsburgh. Muck Bar made from Scrap is about $25.50 to $26, Pittsburgh.

Steel Rails.—It is estimated that already fully 500,000 tons of Rails have been placed with the mills for 1907 delivery. Contracts recently placed for this year delivery include 10,000 tons for the Big Four, 9500 tons for the Pittsburgh, Binghamton & Eastern trolley line and 15,000 tons for the Chesapeake & Ohio. The Pennsylvania Railroad is in the market for about 200,000 tons and the Lake Shore for 100,000 tons, for 1907 delivery. The Ohio works of the Carnegie Steel Company is now running on Rails exclusively and is turning out about 1600 tons per day. This plant will continue on Rails for the balance of this year and probably into next year. Light Rails are very active and prices are firm. We quote Standard Sections at $28 at mill. We quote Light Rails as follows: 8-lb., $36; 10-lb., $32; 12-lb., $30; 16-lb., $29; 20-lb., $28.50; 25 to 45 lb., $27.50 to $28, maker's mill.

Rods.—While the demand is quiet the prices of Rods are very firm. We quote Bessemer and Open Hearth Rods from $34 to $35 and Chain Rods $35 and higher, f.o.b. Pittsburgh.

Skelp.—The mills rolling Skelp are quite busy, and a fair amount of new tonnage is being placed. Prices are firm and we quote: Grooved Steel Skelp, 1.57½c. to 1.60c.; Sheared Steel Skelp, 1.60c. to 1.65c.; Grooved Iron Skelp, 1.65c. to 1.70c.; Sheared Iron Skelp, 1.75c. to 1.80c., Pittsburgh, these prices being for ordinary widths and gauges.

Structural Material.—The mills and Structural shops are crowded so far ahead with work that it is certain a very large tonnage of Material that should have been delivered this year will have to go over until next year. Contracts placed during the week include 5000 tons for the new Open Hearth building of the Bethlehem Steel Company and about 600 tons for a new building for the Midland Steel Company near Beaver, Pa., both taken by the McClintic-Marshall Construction Company. A good deal of bridge work is in sight and part of it will be placed within the next week. In spite of the very active conditions in the Structural trade and the large amount of tonnage booked ahead prices have remained relatively low, and for this reason some of the larger Structural concerns have not been particularly anxious to take work recently, believing that later on prices will improve. The market is very firm, and we quote: Beams and Channels, up to 15-inch, 1.70c.; over 15-inch, 1.80c.; Angles, 3 x 2 x ¼ inch thick up to 6 x 6 inches, 1.75c.; 8 x 8 and 7 x 3½ inches, 1.80c.; Zees, 3-inch and larger, 1.70c.; Tees, 3-inch and larger, 1.75c. Under the Steel Bar card Angles, Channels and Tees under 3-inch are 1.60c., base, for Bessemer and Open Hearth, subject to half extras on the Standard Steel Bar card.

Plates.—The general demand for Plates is undoubtedly better, and specifications on contracts are coming in very freely. There is still a shortage of Steel among the Plate mills, which is interfering with the output to some extent, but some of the mills are able to promise deliveries inside of two or three weeks. There is some uneasiness in prices and in some cases concessions of $1 to $2 a ton are being made. Official prices are as follows: Tank Plates, ¼-inch thick, 6¼ up to 100 inches in width, 1.60c., base, at mills, Pittsburgh. Extras over the above prices are as follows:

	Extra per 100 pounds.
Gauges lighter than ¼ inch to and including 3-16-inch Plates on thin edge	$0.10
Gauges Nos. 7 and 8	.15
Gauge No. 9	.25
Plates over 100 to 110 inches	.05
Plates over 110 to 115 inches	.10
Plates over 115 to 120 inches	.15
Plates over 120 to 125 inches	.25
Plates over 125 to 130 inches	.50
Plates over 130 inches	1.00
All sketches (excepting straight taper Plates varying not more than 4 inches in width at ends, narrowest end being not less than 30 inches)	.10
Complete Circles	.20
Boiler and Flange Steel Plates	.10
"A. B. M. A." and ordinary Fire Box Steel Plates	.20
Still Bottom Steel	.30
Marine Steel	.40

Shell Grade of Steel is abandoned.

TERMS.—Net cash 30 days. For anticipated payments a maximum discount may be allowed at the rate of 6 per cent. per annum and for a longer time than 30 days interest shall be charged at the same rate per annum. Invoices paid within ten days from date thereof, discount of ⅓ of 1 per cent. is allowable. Pacific Coast base, 1.60c., f.o.b. Pittsburgh, with all rail tariff rate of freight to destination added, no reduction for rectangular shapes 14 inches wide down to 6 inches of Tank, Ship or Bridge quality.

Sheets.—The demand for Sheets is showing some betterment, and already a good deal of tonnage for Roofing Sheets has been placed for San Francisco delivery, the mills giving preference in deliveries on such contracts. Most of the Sheet mills are filled up to July 1 or longer, and cannot take orders for delivery within 60 days from date. There is a continued scarcity of Sheet Bars, and the Carnegie Steel Company, which is the principal producer, is very much behind in deliveries. The American Sheet & Tin Plate Company has a good deal of its Sheet capacity standing idle for want of Sheet Bars. Prices on Sheets seem to be slightly firmer, and 2.30c., Pittsburgh, is now about minimum of the market on No. 27. We quote: Black Sheets, Box Annealed, one pass through cold rolls, Nos. 10 to 12 gauge, 1.95c. to 2c.; Nos. 13 and 14, 2c. to 2.05c.; Nos. 15 and 16, 2.05c. to 2.10c.; Nos. 17 to 21, 2.10c. to 2.15c.; Nos. 22 to 24, 2.15c. to 2.20c.; Nos. 25 and 26, 2.20c. to 2.25c.; No. 27, 2.25c. to 2.30c.; No. 28, 2.35c. to 2.40c.; No. 29, 2.50c. to 2.55c., and No. 30, 2.60c. to 2.65c. We quote Galvanized Sheets as follows: Nos. 10 and 11, 2.30c. to 2.35c.; Nos. 12 to 14, 2.40c. to 2.45c.; Nos. 15 and 16, 2.50c. to 2.55c.; Nos. 17 to 21, 2.65c. to 2.70c.; Nos. 22 to 24, 2.80c. to 2.85c.; Nos. 25 and 26, 3c. to 3.05c.; No. 27,

3.20c. to 3.25c.; No. 28, 3.40c. to 3.45c.; No. 29, 3.65c. to 3.70c., and No. 30, 3.90c. to 3.95c. We quote No. 28 Gauge Painted Roofing Sheets at $1.60 to $1.65 per square, and Galvanized Roofing Sheets, No. 28 gauge, at $2.95 to $3 per square for 2-inch corrugations. These prices are for carload lots, jobbers charging the usual advances for small lots from store.

Bars.—Only a fair amount of new business is being placed in Steel Bars since the recent large contracts of the implement trade were taken by the mills on the 1.40c. basis. It is understood that some large consumers are holding off placing large contracts, in the hope that they will be allowed the same concession of $2 a ton that was given to the implement makers. However, the market is firm at 1.50c. and is practically certain to remain at that figure. Business in Iron Bars is fairly heavy, a good deal of tonnage having been placed with the mills since prices of Iron Bars were put on the same basis as Steel Bars. We quote: Iron and Steel Bars at 1.50c., base, half extras, for carloads and larger lots, f.o.b. Pittsburgh.

Cotton Ties.—Occasionally a stray order comes in for Cotton Ties, but practically all needed this year was placed some time ago with the mills when the price was fixed at 85c. per bundle.

Hoops and Bands.—All the four mills that are rolling Hoops and Bands are extremely busy, some good sized contracts having been recently placed at the full official price of 1.90c. We quote Steel Hoops at 1.90c., and Bands for all purposes at 1.50c., base, half extras, as per Standard Steel card. These prices are for carload lots, f.o.b. Pittsburgh, plus full tariff rail rate to point of delivery, an advance of $2 a ton being charged for less than carloads.

Tin Plate.—Only a limited amount of new business is being placed, but the mills are very busy on contracts taken some time ago when the prices were lower than they are now. We may state that the present official price of $3.55 per box on Tin Plate is being shaded. We quote Tin Plate at $3.60 per base box, f.o.b. Pittsburgh, for 14 x 20 100-lb. Cokes, terms 30 days, less 2 per cent. off for cash in ten days, on which price a rebate of 5c. a box is allowed for carloads and larger lots.

Merchant Steel.—Some large contracts for Smooth Finished Machinery Steel and also for shafting have recently been placed by the implement trade, and the mills are very busy, being still considerably behind in deliveries. Prices are firm and we quote: Planished or Smooth Finished Tire Steel, 1.70c.; Iron Finish up to 1½ x ½ inch, 1.65c., and Iron Finish, 1½ x ½ inch and larger, 1.50c., base, Pittsburgh, and Channels for solid rubber tire are quoted as follows: ¾, ⅞ and 1 inch, 2c., and 1⅛-inch and larger, 1.90c.; Toe Calk Steel, 2c. to 2.05c.; Railway Spring Steel, 1.75c. to 1.80c.; Cutter Shoes, 2.20c. to 2.25c.; Flat Sleigh Shoe, 1.50c. to 1.55c.; Crucible Tool Steel, 6c. to 8c. for ordinary grades and 12c. and upward for special grades. We quote Cold Rolled Shafting at 50 per cent. discount in carloads and 45 per cent. in less than carloads, delivered in base territory.

Railroad Spikes.—The demand continues exceedingly heavy, and as the mills have a very large tonnage on their books, they are somewhat behind in deliveries. The minimum of the market on standard sizes of Spikes is $2, with some makers holding at $2.05, f.o.b. Pittsburgh.

Spelter.—The market continues very quiet, and we quote prime grades of Western Spelter at 5.90c., St. Louis, equal to 6.02½c., Pittsburgh.

Merchant Pipe.—The National Tube Company has taken a contract for about 25 miles of 4, 6, and 8 inch Pipe for shipment to Canada. Some other large Line Pipes are under negotiation and are expected to be closed within a short time. On the larger sizes of Pipe the mills are filled up for some months ahead and cannot take additional tonnage for early delivery. We note a continued active demand for Merchant sizes of Pipe, and the tonnage on the books of the mills is heavy. Prices continue very low, the extreme discount on Steel Pipe remaining at 81 per cent. off. This price, however, is made only to the very large trade, the regular market on ¾ to 6 inch being 80 and 81 per cent. off. Discounts are as follows:

Merchant Pipe.

	Jobbers, carloads.			
	Steel.		Iron.	
	Black.	Galv.	Black.	Galv.
	%	%	%	%
⅛ and ¼ inch	72	56	60	53
⅜ inch	74	60	71	57
½ inch	76	64	73	61
¾ to 6 inches	80	70	77½	67½
7 to 12 inches	75	60	72½	57
Extra strong, plain ends:				
⅛ to ⅜ inch	65	53	62	50
½ to 4 inches	72	60	69	57
4½ to 8 inches	68	56	65	53
Double extra strong, plain ends:				
½ to 8 inches	61	50	58	47

Boiler Tubes.—On Locomotive Tubes the demand is very heavy, prices being firm, and the mills are some weeks behind in deliveries. Prices on Merchant Tubes have been materially shaded for some time and at present are being cut about four points, or $8 a ton, under the official discounts, which are as follows:

Boiler Tubes.

	Iron.	Steel.
1 to 1½ inches	41	46
1¾ to 2¼ inches	41	58
2½ inches	46	60
2¾ to 5 inches	53	66
6 to 13 inches	41	58

Iron and Steel Scrap.—The market continues very quiet and prices do not show any betterment. Large consumers are holding off from buying and the amount of new tonnage being placed is light. Dealers quote as follows: Heavy Melting Scrap, $15; No. 1 Wrought Scrap, $17; Bundled Sheet Scrap, $14 to $14.25; Machinery Cast Scrap, $15 to $15.25; Old Steel Rails, short pieces, $15; Old Steel Rails, long pieces for rerolling, $15.50; Cast Iron Borings, $8 to $8.25; Old Car Wheels, $17.25 to $17.50; Old Iron Axles, $24 to $24.50; Old Steel Axles, $20 to $20.50; Wrought Turnings, $12; all in gross tons, f.o.b. cars, Pittsburgh. It is probable that on a firm offer some dealers would slightly shade the above prices.

Coke.—The settlement of the threatened strike in the Anthracite Coal region has already caused an easier feeling in prices of Coke, and the best grade of strictly Connellsville Furnace Coke are now offered at $2.50 to $2.60, and 72-hour Connellsville Foundry Coke at $3 a ton, at oven. Outside makes of Furnace Coke are offered at $2 to $2.25, and Foundry at $2.50 to $2.75, at oven. The demand for both Foundry and Furnace Coke have been quite active recently and the best grades of Coke for May shipment are scarce. The output continues heavy, the Upper and Lower Connellsville regions having made last week about 375,000 tons.

The San Francisco offices of the Jones & Laughlin Steel Company, which were in the Crocker Building, were badly damaged by the recent earthquake and are now temporarily located at San Mateo, Cal., with William Best, Jr., acting sales agent, in charge.

Cleveland.

CLEVELAND, OHIO, May 8, 1906.

Iron Ore.—The resumption of Iron Ore movements may be expected inside of ten days. The lake strike is practically at an end now. It remains only to work out the details of the settlement, but there is a growing sentiment among the dock managers and members of the Lake Carriers' Association in favor of an open shop on the docks. Developments during the past week came rapidly. On Monday night the unions affiliated with the longshoremen struck, with the exception of the Licensed Tugmen's Protective Association, the president of which was sick in bed. The tug firemen, however, went on strike and the licensed men were laid off. Ore and coal docks became idle at once, as boats were tied up all along Lake Erie, not being able to reach their docks inside the harbors. A big fleet of vessels, however, completed discharging their cargoes and turned up the lakes before Monday midnight. Ore docks at the head of the lakes, being operated by nonunion men, continued active during the week and loaded as many vessels as came. This kept a stream of ore coming down the lakes, but the boats could not be unloaded, except at the four docks at Buffalo, owned by the railroads, and the Steel Corporation dock at South Chicago. No effort was made until Monday of this week to unload the docks along Lake Erie. There is in consequence a serious congestion of boats at Lake Erie ports, which will continue until the strike is settled or the places of strikers have been taken by other men. The movement of ore from the head of the lakes during the two weeks of April was 1,447,386 tons, as compared with 1,195,173 tons up to May 1 last year. This shows a material increase, sufficient to make the supply on hand adequate for the apparent needs of the furnaces during the remainder of this month. The reports from various ports along Lake Erie tell of a dwindling of last year's surplus under the consumption at the furnaces. The supply at Conneaut is small, but this is not unusual. These docks are owned by the Steel Corporation, which does not allow the ore to collect there. Ashtabula reports less ore on dock than for years. In Cleveland the new storage yard of the Erie at Randall has only about a week's supply on hand, although the Whiskey Island docks are still well stocked. Huron is pretty well cleaned up, but the furnace docks at Toledo are not bothered with any suggestion of a shortage. New supplies have been received lately. This week news has reached Cleveland from Washington to the effect that the Secretary of War has approved the plans of the Lake Shore for the construction of new docks at Ashtabula, to cost over $3,000,000. They will be for the handling of ore and coal.

Finished Iron and Steel.—An improved demand has sprung up for Structural Steel, and with it has been a better demand also for Plates. The lagging spirit in Plates which was shown for several weeks is beginning to disappear under new buying from car companies. Billets are still scarce and prices are high. Forging Billets will bring $35 at the mill, although many consumers say they cannot use them with profit at that price. Sheets are strong, largely because of the slack supply of Sheet Bars, and are quoted out of stock,

f.o.b. Cleveland, as follows: No. 10 Black, 2.15c.; No. 28, One Pass Cold Rolled, 2.70c.; No. 28 Galvanized, 3.70c. Bars are easy, although showing some improvement. Bar Steel is still quoted at 1.50c., Pittsburgh, for both Bessemer and Open Hearth, while Bar Iron is selling at 1.50c. to 1.60c., Pittsburgh.

Pig Iron.—Buying is still heavy. Up to this time the principal demand has been for third quarter delivery, with some buying extending into the fourth quarter. During the week inquiries have seemed to be more numerous for second half buying and some would even like to anticipate needs for the first quarter of next year. The business has been satisfactory all the way through. The minimum price on No. 2 Foundry has continued to be $16.50 in the Valleys, with some of the furnaces holding for $17.

Old Material.—The buying has shown some improvement during the week, but the supply is still abundant and the market is only a little stiffer. Prices are unchanged for the week, being as follows, f.o.b. Cleveland, gross tons: Old Steel Rails, $14.50 to $15.50; Old Iron Rails, $22 to $23; Iron Car Axles, $18.50 to $19.50; Heavy Melting Steel, $14.50 to $15. Net tons: Cast Borings, $8.50 to $9; No. 1 Busheling, $12.50 to $13; No. 1 Railroad Wrought, $15 to $16; No. 1 Cast, $13.50 to $14.50; Stove Plate, $10.50 to $11; Iron and Steel Turnings and Drillings, $9.50 to $10.50.

New York.

NEW YORK, May 9, 1906.

Pig Iron.—During the week two Connecticut foundries have purchased between them about 6000 tons, one buyer covering requirements for the whole of the second half. The leading electrical company is in the market for 8000 to 10,000 tons, and a large pump co cern is also negotiating. Prices are somewhat irregular in competitive territory. The resumption of mining in the Anthracite Coal fields will only moderately affect the supply of Pig Iron in the Lehigh and Schuylkill Valleys, the furnaces not having suffered much from scarcity of fuel during the suspension of work. We quote, Northern No. 1 Foundry, $18.50 to $19; No. 2 Foundry, $18 to $18.50; No. 2 Plain, $17.50 to $18. Southern Iron is quoted at $18.25 to $18.50 for No. 1 Foundry, and $17.25 to $17.50 for No. 2 Foundry.

Steel Rails.—It is with increasing difficulty that any business for 1906 delivery is now placed, and the probabilities are that some Rails scheduled for rolling this year will yet be carried over to 1907. Some further small orders for 1906 have been placed, including 4500 tons for the City & County Construction Company and 1800 tons for the Michigan Central. In addition to 190,000 tons in three contracts for 1907, announced last week, comes the preliminary reservation of the Pennsylvania Railroad for 180,000 tons, but the distribution to the various mills has not yet been made. The Tennessee Coal, Iron & Railroad Company has 150,000 tons booked for 1907, and a number of inquiries for its Open Hearth Rails are pending.

Structural Steel.—The injunction against opening the bids submitted last week for the building of the Manhattan Bridge was dissolved, and the bids were opened on Monday, May 7. There is still pending an injunction against the making of any award in view of the contract for this bridge entered into last year with the Pennsylvania Steel Company. The bids opened on Monday were as follows: American Bridge Company, $8,312,146; John Peirce Company, $6,596,638; Ryan-Parker Construction Company, $6,493,223; General Erecting Company, $6,769,191; Milliken Brothers, $7,566,191. The bid of the Ryan-Parker Construction Company, which is the lowest, is about $800,000 less than that of the Pennsylvania Steel Company, in August, 1905, which was $7,284,739. While the larger Structural contracts in New York still wait, new building is constantly being undertaken. Milliken Brothers will erect the Steel for the extension to the Bourne Building on Liberty street, about 1000 tons. The same firm will furnish the Steel work for the Smith-Gray Building, which the Gerry Estate is erecting at Broadway and Warren street. It will require 1200 tons. The American Bridge Company has booked 8000 or 9000 tons in the past week, and its record for April exceeded the expectations, being 61,000 tons. The estimated total was swelled late in the month by a number of contracts taken at Pittsburgh, including two office buildings requiring 2500 tons of Steel each, an apartment house, which will require 2500 tons, and an addition to the Carnegie mills, 500 tons. A considerable tonnage of Steel will yet be needed for the new construction going on at the McKeesport works of the National Tube Company. Among bridge work closed by the American Bridge Company is 3000 tons for the Northern Pacific, the order calling for 56 duplicate spans, all taking 80-foot Plate Girders. The Atlantic Coast Line has contracted with the same company for 600 tons more of bridge work, the L. & N. for 650 tons, the Atchison, Topeka & Santa Fé for 715 tons. For the Long Island Railroad improvement at Atlantic avenue, including buildings and yard construction, 600 tons were ordered from the American Bridge Company. The Savoy Hotel addition was also let in the past week. It calls for 1500 tons. A Montreal representative of a Scotch Structural works has been in New York recently soliciting orders. No advantage in price is offered, but very prompt deliveries are guaranteed. San Francisco business has been much talked about, without coming to anything as yet in tonnage. One Steel company sold 1000 tons of Structural Shapes in the week for San Francisco delivery, but it goes to replenish a dealer's stock and is for no specific erection. No business has been placed with German mills on San Francisco account, and the cabled reports of large inquiries received at Düsseldorf are part of the general crop of rumors, which has very little substance. It is evident that the Steel mills are not to be heavily requisitioned on account of San Francisco rebuilding for a considerable time. We quote as follows on mill shipments for tidewater deliveries: Beams, Channels, Angles and Zees, 1.84½c.; Tees, 1.89½c.; Bulb Angles and Deck Beams, 1.99½c. Beams, 18 to 24 inch, 0.10c. extra; Angles over 6 inches, 0.10c. extra. Out of stock Beams and Channels are sold at 2.50c. to 2.75c.

Bars.—An increasing volume of business is reported in both Iron and Steel Bars. Inquiries are much better. Prices range from 1.64½c. to 1.74½c., tidewater, according to deliveries and specifications.

Plates.—While the local demand is light, as consumers generally are purchasing very sparingly, at least one good inquiry is in the market, which calls for about 10,000 tons of half-inch Plates, to be used in the construction of riveted Pipe for the Valley Stream extension of the Brooklyn water supply, on which the Department of Water Supply, Gas and Electricity of the City of New York will open bids May 23. The mills are still well supplied with work and prices are firmly maintained. Quotations are as follows, at tidewater: Sheared Tank Plates, 1.74½c. to 1.84½c.; Flange Plates, 1.84½c. to 1.94½c.; Marine Plates, 2.14½c. to 2.24½c.; Fire Box Plates, 2.24½c. to 2.60c., according to specifications.

Cast Iron Pipe.—The City of Philadelphia will open bids June 4 for 23 miles of 48-inch pipe, requiring, with specials, about 40,000 tons. The Warren Foundry & Machine Company was the lowest bidder on 4100 tons of 6 to 20 inch pipe and 40 tons of specials for Brooklyn, on which bids were opened May 3. The foundries generally report business keeping up very well, the demand for small lots being fully as active as at any previous time this year. Carload lots of 6-inch are quoted at $30.50 per net ton at tidewater.

Old Material.—Dealers' business has been affected to some extent the past week by the appearance of the usual monthly railroad lists which have been largely used by consumers for direct purchases. While Old Steel Rails and Scrap Steel would appear to be somewhat easier, the supply is nevertheless so limited that dealers will take no chances in accepting orders for future delivery at current prices, but a leading local dealer in a position to control a fair quantity reports sales aggregating about 6000 tons. The situation in Cast Scrap is very strong, owing to the limited stocks in dealers' yards, but the demand has abated. Rolling mill material is holding its own. Relaying Rails are active and strong. Prices of Old Material in a general way are a trifle easier, but quotations have not yet been sufficiently affected to warrant changes in the following approximate prices, which are per gross ton for New York and vicinity:

Old Iron Rails	$20.50 to $21.50
Relaying Rails	25.50 to 26.00
Old Steel Rails, rerolling lengths	16.50 to 17.50
Old Steel Rails, short pieces	15.50 to 16.00
Heavy Melting Steel Scrap	15.50 to 16.00
Standard Hammered Iron Car Axles	25.00 to 26.00
Old Steel Car Axles	20.00 to 21.00
No. 1 Railroad Wrought	19.00 to 20.00
Iron Track Scrap	16.50 to 17.50
No. 1 Yard Wrought, long	17.50 to 18.00
No. 1 Yard Wrought, short	15.50 to 16.00
Wrought Pipe	14.00 to 14.50
Light Iron	10.00 to 10.50
Cast Borings	9.00 to 9.50
Wrought Turnings	12.50 to 13.50
Old Car Wheels	17.00 to 18.00
No. 1 Machinery Cast	15.50 to 16.00
Stove Plate	11.50 to 12.00
Grate Bars	10.50 to 11.00
Malleable Cast	16.50 to 17.50

Thomas Turnor, Steel Rails and Railroad Supplies, formerly in the Coal and Iron Exchange, Cortlandt and Church streets, New York, has removed to Room 409, Havemeyer Building, 26 Cortlandt street.

Matthew Addy & Co. have removed their New York offices from 15 Cortlandt street to 39-41 Cortlandt street, as the building which they formerly occupied is now being torn down.

L. F. Shoemaker & Co., Schuylkill Bridge Works, have opened a contracting office at 45 Broadway, New York. Lewis D. Rights, who was in charge of their office in New Haven, Conn., will have charge of the New York office, with title of contracting manager.

Metal Market.

NEW YORK, May 9, 1906.

Pig Tin.—In a feverish and excited market the price for spot Tin was carried up to 43.50c. to-day. This is not the price for strictly spot Tin, as there is little or no Tin in store, but it is for Tin out of steamship Minnetonka, which will unload on Thursday. The price has rapidly advanced to this extraordinary level from 40.20c. a week ago to 40.70c. on Thursday, 42.35c. on Monday and 43.30c. on Tuesday. The London market is also feverish and excited, and closes to-day with spot at £197 5s. Future supplies are held at £188 12s. 6d., a backwardation of more than is usually the case, and which reflects active operations of the manipulators. As far as spot stocks in New York are concerned, however, the market is exceedingly strong, and will undoubtedly continue so for the next two weeks, as the arrivals so far this month aggregate but 1047 tons. There are scheduled to arrive 1295 tons, but this will scarcely be sufficient for this month's requirements and any other supplies must come from London, as it is impossible to secure shipments from the Straits for delivery this month. The London dealers are of the belief that they cannot spare any Tin from the market, consequently the unusually strong position in this market and the likelihood of its continuation. Consumers seem to be buying freely, and are apparently not deterred by these unusual prices.

Copper.—The situation is strong, and although nominal quotations of 18.62½c. to 18.75c. for Lake, 18.25c. to 18.50c. for Electrolytic, 18.12½c. to 18.37½c. for Casting Grades are made, still sales have been made at considerably higher prices, especially for Electrolytic, as it is known that Copper of this grade has been sold both in this country and in Europe on a basis of 18.75c. for May and June shipments. It is also stated on good authority that a leading brand of Lake Copper has been sold at 19c. This would not be surprising in view of the confirmed prices for Electrolytic. For nearby shipments consumers will probably have to pay premiums over these prices. It is no secret in the metal trade that considerable dissatisfaction is resulting from the low prices now being quoted on the New York Metal Exchange, especially for Electrolytic brands of Copper. Some good sized sales have been made for July shipments, while some orders have been taken at 18½c. for August shipment. The future demands for Electrolytic are better than those for Lake, both in this country and abroad. The quoted prices for Europe are £83 7s. 6d. for spot, £82 7s. 6d. for futures, with Best Select held at £88. It is known, however, that Electroyltic Copper has been sold at prices equivalent to £88 10s. The exports so far this month are very small, aggregating but 3543 tons.

Pig Lead.—The better demand noticed last week has continued, and the chief news of importance is the advance in price by the American Smelting & Refining Company to 5.60c. for desilverized Lead, in 50-ton lots, on 30-day shipments. Local holders are asking 5.87½c. to 5.90c. for spot. The market in St. Louis is also considerably firmer and is quoted at 5.72½c., bid. The price of Lead Ore has again advanced. The total shipments of Ore from the Joplin district are about 20 per cent. larger this year than during the corresponding period last year. In London the market is firm, at £16 10s.

Spelter.—Dullness continues and prices are unchanged, at 6c. to 6.10c for Spot May and June. In St. Louis, 5.90c. to 5.95c. is quoted. The price of Zinc Ores has declined somewhat and the assay basis price is quoted at $40 to $41 per ton. In London the market is unchanged at £26 5s.

Nickel.—There is a good demand at the unchanged quotation of 40c. to 47c. for large lots; 50c. to 60c. for smaller quantities.

Quicksilver.—The price is unchanged at $40 to $41 per flask of 75 lbs. in 100-flask lots.

Antimony.—Prices are quoted very firm at 24c. to 25c. for Cookson's and Hallett's; 23½c. to 24½c. for other brands. In London Hallett's has been advanced to £110. There is some irregularity so far as the price is concerned, as the advance has been so rapid that dealers having supplies on hand are willing to make concessions, there being excellent profit at the present time. Some of the metal now being shipped to this country was bought by consumers on a 12c. basis.

Aluminum.—There is still little or no material available for prompt shipment, but the nominal price continues unchanged at 37c. No. 1 Ingots and 35c. for No. 2.

Tin Plate.—Prices are firmly held, on a basis of $3.79 f.o.b. New York, and $3.60 f.o.b. Pittsburgh, subject to the usual cash discount. The extraordinary price for Pig Tin may have some effect on the market in the near future in the way of advancing prices. The English market has advanced 3d., or to 13s. per box, on account of the high price of Tin.

Old Metals.—Copper is in good demand, and dealers are holding the heavier grades at advanced quotations. A like condition of affairs prevails in the Old Brass market, the heavier grades being especially sought after. Lead has likewise advanced. Dealers' selling quotations are as follows:

	Cents.
Copper, Heavy Cut and Crucible	18.00 to 18.25
Copper, Heavy and Wire	17.50 to 18.00
Copper, Light and Bottoms	16.00 to 16.25
Brass, Heavy	12.50 to 12.75
Brass, Light	10.50 to 10.75
Heavy Machine Composition	16.50 to 17.00
Clean Brass Turnings	10.50 to 11.75
Composition Turnings	13.50 to 14.00
Aluminum Scrap	26.00 to 28.00
Lead, Heavy	5.20 to 5.45
Tea Lead	5.00 to 5.20
Zinc Scrap	4.90 to 5.00

The New York office of the Merchant & Evans Company has been removed to 224-226 Pearl street, near Burling slip.

Iron and Industrial Stocks.

NEW YORK, May 9, 1906.

The furious liquidation which was in progress in the stock market at the date of our last report spent its force on Thursday, and from that time prices have strengthened steadily from day to day. The range from lowest to highest prices on active iron and steel stocks from Thursday up to Tuesday afternoon of this week was as follows: Can preferred, 59¾ to 62; Car & Foundry common, 36 to 39; preferred, 100 to 102; Locomotive common, 56 to 61⅞; preferred, 112 to 114; Steel Foundries preferred, 43 to 46; Colorado Fuel, 41½ to 49⅛; Pressed Steel common, 44 to 49; preferred, 95½ to 97½; Railway Spring common, 47⅛ to 51½; Republic common, 23¼ to 27⅛; preferred, 92½ to 98; Sloss-Sheffield common, 70⅝ to 77; Tennessee Coal, 135 to 149; Cast Iron Pipe common, 44½ to 49; preferred, 91 to 93; Steel common, 37¼ to 39⅞; preferred, 103½ to 106½. Last transactions up to 1.30 p.m. to-day were made at the following prices: Can common, 7; preferred, 61½; Car & Foundry common, 39⅞; preferred, 101¾; Locomotive common, 65⅜; preferred, 113½; Steel Foundries common, 11⅛; preferred, 45½; Colorado Fuel, 52; Pressed Steel common, 50⅞; preferred, 97½; Railway Spring common, 51¾; Republic common, 27¾; preferred, 100½; Sloss-Sheffield common, 77; Tennessee Coal, 146½; United States Cast Iron Pipe common, 49; United States Steel common, 40½; preferred, 105½, ex-dividend.

The stockholders of the International Steam Pump Company at a special meeting, held at Jersey City Tuesday afternoon, increased the preferred stock of the company from $12,500,000 to $15,000,000, and the common stock from $18,500,000 to $24,000,000, by the issue of 25,000 shares of new preferred and 55,000 shares of new common stock, for the purpose of acquiring the outstanding stock of the Power & Mining Machinery Company, now controlled by Benjamin Guggenheim, and which manufactures gas engines, gas producing plants and general mining machinery, with a large plant at Cudahy, Wis.

The reported failure of the plan by which the Colorado Fuel & Iron Company proposes to raise $4,160,000 for the purpose of providing additional equipment for the company's plants has called forth a statement from President Frank J. Hearne, who says: "It is customary to have offerings of this character underwritten, which precaution has not been omitted in this instance. Every share of stock and bonds offered and not taken by the stockholders will be subscribed for by a strong underwriting syndicate, and the financial plans of the company will be completed precisely as originally intended."

Dividends.—Niles-Bement-Pond Company has declared the regular quarterly dividend of 1½ per cent. on the preferred stock, payable May 15.

Pratt & Whitney Company has declared the regular quarterly dividend of 1½ per cent. on the preferred stock, payable May 15.

Ashton Valve Company has declared a quarterly dividend of 1½ per cent., payable May 15.

In the presence of a small gathering of leading members of the three national societies on Tuesday, Andrew Carnegie and Mrs. Carnegie laid the corner stone of the building of the United Engineering Society. The great structure is now nearly under roof, and it is expected that early next year the Mining, Mechanical and Electrical Engineers' societies will be installed in it. The Mechanical Engineers have just sold their New York house, realizing $120,000, which is just double the sum it cost a number of years ago.

The Riter Conley Mfg. Company, Pittsburgh, Pa., has received a contract for the iron work for four blast furnaces to be built by the United States Steel Corporation at Gary, Ind. These furnaces will each be 85 x 22½ feet,

and about 10,000 tons of plates, structural steel and castings of various kinds will be used in their construction. They will not be completed for about one year, but as soon as they are ready for blast the building of four more stacks of the same size will be started. This is the first actual construction contract placed by the Steel Corporation in the building of its great new Western plant.

Blast Furnace Gas Engine Development in the Pittsburgh District.

The Carnegie Steel Company has made a long step in the right direction by its recent adoption of gas engines to utilize surplus gas from its blast furnaces for the generation of power needed in the electric driving of mill machinery. Some time ago the company contracted with the Westinghouse Machine Company, Pittsburgh, builder of large engines and turbines, for some large blowing engines to be driven by blast furnace gas. For the purpose of conducting preliminary experimental work, an engine of 350 h. p., running at 150 revolutions with 30-inch stroke, was installed and has since made a remarkable record for itself under the severest possible tests for efficiency, reliability, and durability. The two gas blowing engines, the largest ever built in this territory, are now under construction at East Pittsburgh for the Edgar Thomson Works at Bessemer, near Pittsburgh.

These will be twin tandem units with Slick air blowing tubs arranged in front or *vis-a-vis* and with fly wheel interposed between the two sides of the engine. Each of these blowing units will have a capacity of 25,000 cubic feet of free air per minute, operating against a normal blast pressure of 18 pounds and running at a speed of 60 to 75 revolutions per minute. When higher pressure is demanded by the furnaces the valve gear of the engine may be so altered as to deliver air under pressures up to 25 pounds per square inch in proportionately less quantity. These engines are of the heavy duty double acting type, as standardized by the Westinghouse Machine Company, and will be among the largest ever constructed for use with blast furnace gas.

Very recently the Carnegie Steel Company has contracted with the Westinghouse Machine Company for another blast furnace gas engine unit similar in design to the blowing units above mentioned, except that the engine will drive a direct connected electrical generator for the purpose of augmenting the present power service at the Bessemer works. The gas engine will have the same stroke as the blowing unit, namely, 54 inches, and operating at a normal speed of 75 revolutions per minute, will develop approximately 2500 brake horse-power on blast furnace gas. The generator will be a 1500-kw. direct current machine connected in parallel with the other steam machinery at the present Edgar Thomson power plant.

The Carnegie Steel Company, by its utilization of surplus blast furnace gas for power work, has inaugurated this essentially modern practice in the Pittsburgh district, and further development is certain. The type of engine adopted is also very promising, as indicated by the service rendered by several engines of this design already in operation, notably those of the Warren & Jamestown Street Railway, Warren, Pa., where two 500 horse-power polyphase units are operating in parallel on an extremely severe interurban load.

It is officially denied that the Crucible Steel Company of America has let contracts for a new plant at Thirty-sixth street and Allegheny Valley Railroad, Pittsburgh. The company owns a large site at this location and no definite plans have been made for the building of a plant of any kind on it. It is true, however, that the company will erect a new plant at Sixty-first street and Allegheny Valley Railroad, Pittsburgh, and the structural builders have inquiries for a large steel building to contain the new mill.

Charles M. Schwab sails to-day for an extended trip abroad.

Labor Notes.

A strike of molders in the district about Scranton, Pa., from Honesdale to Tamaqua, was declared at meetings of local unions in the various towns on April 29. The strike is to enforce a demand of the union for a nine-hour day. The issue of the open shop is also made by the employers. The shops of two companies, including the Vulcan Iron Works of Tamaqua, are reported to have granted the shorter work day. About 200 molders are out at Scranton and several hundred in the various other towns involved. The following companies are associated in opposition to the demands of the union molders: Allis-Chalmers Company, Scranton Steam Pump Company, Finch Mfg. Company, Touhill Iron Works, McClave-Brooks Company and Scranton Machine Works, Scranton; Exeter Machine Works, Pittston; Jeansville Iron Works Company and Hazleton Iron Works Company, Hazleton; Tamaqua Mfg. Company, Tamaqua; Coyne Steam Pump Company, Ashland; Hendrick Mfg. Company, Carbondale Machine Company and Gross Engine Company, Carbondale.

The American Foundrymen's League, of which E. C. Stearns, Syracuse, New York, is president, has issued a list of open and non-union foundries in the United States. Of the total number 5 are in Alabama, 20 in California, 5 in Connecticut, 2 in Delaware, 7 in Georgia, 35 in Illinois, 14 in Indiana, 7 in Iowa, 3 in Kansas, 3 in Kentucky, 2 in Louisiana, 5 in Maine, 1 in Maryland, 24 in Massachusetts, 16 in Michigan, 27 in Minnesota, 1 in Mississippi, 10 in Missouri, 1 in New Hampshire, 17 in New Jersey, 69 in New York, 75 in Ohio, 91 in Pennsylvania, 10 in Rhode Island, 1 in South Carolina, 17 in Tennessee, 1 in Texas, 4 in Vermont, 2 in Virginia, 6 in Washington, 1 in West Virginia and 19 in Wisconsin. The list for Canada shows 31 open and non-union founders in Ontario. The league maintains a free labor bureau for the joint benefit of its members and non-union molders.

In the effort to adjust the demand made recently by iron molders upon the foundrymen of New York and vicinity the foundrymen proposed to submit the questions in dispute to a board of arbitration consisting of four persons, two to be chosen by each side, with power to appoint a fifth arbitrator to decide any question on which the four could not agree. The Iron Molders' Union rejected this proposition and recommended the appointment of a conciliation committee of four, two from each side. This proposition was accepted and the foundrymen appointed H. N. Covell and J. F. Arnold as their representatives. The joint committee reached an agreement on April 30 under which the molders will be paid a minimum wage of $3.25 a day and core makers $3 a day. Infirm and old molders and apprentices just out of their time will be paid a special wage to be agreed upon by them and their employers, and all differences will be settled by arbitration.

A majority of the Chicago foundries have already acceded to the demands of the molders for increased wages and have signed the scale. The indications are that in only a few will any efforts be made to make a firm stand against the demand for increased wages. Fully 90 per cent. of the jobbing foundries signed the scale last week, and of the 24 members affiliated with the National Founders' Association, three are reported to have signed the scale, while some of the remainder have been on a non-union basis for some time and were not affected. Of the remainder, it is reported that about ten will make a firm stand against any increase and will insist upon the open shop principle. At Milwaukee the employers are standing together and steadfastly refuse to grant the increase asked. Of the 27 in that city the only two that have signed the scale are the Central Foundry Company and the Co-operative Foundry Company. The malleable foundries in that district have not been affected and are operating in full.

The Machinery Trade.

NEW YORK, May 9, 1906.

The week has been a good one with the machinery trade, both in the way of orders and inquiries, and the amount of new business before the trade gives promise that the present month will be a big one for business, and lends color to the predictions made by leading machinery men that there will be little, if any, dull season during the summer months. Many of the companies referred to in these columns during the past few weeks as prospective purchasers are closing orders for equipment just now. One of the big engineering firms is placing contracts for a considerable quantity of machinery equipment, and the Delaware, Lackawanna & Western Railroad has given some orders for its power house equipment for the Hoboken terminal. There is a general demand for machine tools from manufacturers who have orders under way, and as an indication of the demand for power equipment it may be said that one New York house was obliged to turn down two large orders because it was unable to furnish the machinery required in the time stipulated by the prospective purchasers. The fact that the Delaware, Lackawanna & Western Railroad intends to build an enormous machine shop and repair plant at Scranton, and that the Erie Railroad will soon build its shops at Jersey City, gives the trade assurance that there will be plenty of railroad business during the summer and fall months. Machinery men who pay attention to export trade will be interested in a report from Consul-General B. H. Ridgely of Barcelona to the Bureau of Manufacturers, giving the rates of the new Spanish tariff to go into effect July 1, which will have a material effect on some branches of the machinery trade. The new tariff provides that all foreign electrical machinery and devices will be subject to a duty of 19.3 cents per kilogram (2.20 pounds). Heavy machinery is to be advanced $4.75 per 100 kg., and there will be a similar tax on machine tools and about every branch of the machinery trade. There seems to be plenty of chance for good export business near home, however, judging from the many large projects begun by American capitalists in Cuba and the Philippines. This country seems to be taking the initiative in the industrial development of those islands, and the machinery trade in New York is getting the major part of the patronage of those who are spending the money for the necessary equipment.

The Atlantic City convention of the National Machine Tool Builders' Association was productive of much that will be of considerable benefit to machine tool builders. At that meeting the Niles-Bement-Pond Company became a member of the association. The addition of so large and important a company to its membership tends not only to strengthen the association by bringing into harmonious relations with it the largest machine tool builder, but also to extend its influence in the machinery trade. A full account of the proceedings of the convention appears in another column of this issue.

To Build Big Railroad Shops.

Plans have been submitted to Warren H. Truesdale, president of the Delaware, Lackawanna & Western Railroad, for a large machine shop and other buildings, to be erected in the yards of the company at Scranton, to take the place of the existing locomotive building and repair plant there, which will be razed to make way for the proposed additions. The machine shop, which will be the most important part of the general reconstruction scheme, will be one of the largest of its kind in the country, according to the plans, which provide for a building 364 x 758 feet. The only building now in the yards at Scranton which will not be torn down is the roundhouse, which is of practically modern construction. The big machine shop will have room enough for the construction of 40 locomotives at one time, which will practically double the present facilities. Among the requirements which the plans show will be needed for equipping the plant will be a 120-ton traveling crane, a 15-ton crane and other minor cranes. There will be two bays to the machine shop, which will be used as erecting shops, and they will be fitted up with two 15-ton cranes each, as well as other erecting machinery. The plans include a power house, a blacksmith shop 126 x 300 feet, a paint shop, pattern shop and pattern storage house, 50 x 300 feet, and other minor structures, including the offices of the superintendent of motive power, the master mechanic, &c. All the machines throughout the plant will be electrically driven, the power for which will be furnished by an extensive plant to be built on the site of the present foundry. There will be new ash pits and coal chutes, besides extensive requirements in the way of coal and ash handling machinery and the like. Of course most of the machinery now in use in the shops will be installed in the new plant, but that will by no means meet the requirements called for in the plans presented for Mr. Truesdale's approval. R. F. Kilpatrick, superintendent of motive power of the Lackawanna, has his offices at Scranton, and he is in direct charge of the proposed improvements. The plans were prepared by him, with the assistance of Chief Draftsman James A. Mellon. President Truesdale said this week that while he had approved of the plans it is probable that the plant will not be reconstructed this year, although preparations toward that end will go on. Some of the work is even now under way. The coal and ash pits are being rebuilt and it is probable that details regarding that part of the coal handling machinery directly connected with the pits will be attended to first. No inquiries have been made in the trade as yet regarding the machinery equipment, and it is thought that it will be some time before the details will be gone into to that extent.

Good Machinery Prospects in Cuba.

Several prominent New York machinery men were visited last week by Jose Primelles, who was the Cuban Director General of Public Works under General Wood, and who is now connected with the engineering firm of C. Hemple, Havana, Cuba. Mr. Primelles is here establishing connections with American machinery houses through the export firm of F. & J. Meyer, 116 Broad street, which is the American connection of the C. Hemple Company. Speaking of the possibilities for American trade with Cuba, Mr. Primelles declared to an *Iron Age* representative that there are excellent possibilities for the machinery trade in that island. He stated that there has been a surprising growth in the industries of Cuba since this country assumed charge of affairs there. While German and English machinery men are firmly established on the island, Mr. Primelles said there is a decided tendency toward patronizing American agents, and where manufacturers in this country can equal or excel their European competitors they are given a good chance. This is especially so with machine tools and road making equipment, along which lines Americans have shown their superiority. The Government is preparing to spend $4,000,000 in Cuba on bridges and roads, and consequently considerable attention has been paid to machinery used in that class of work and manufacturers of American road making machinery will reap a harvest. Machine tool builders, who are fortunate enough to have good connections in Cuba are doing an excellent business, and as an illustration of the fact that there are great possibilities for the general machinery trade Mr. Primelles pointed out the example set by two Spanish companies who, on finding that they were handicapped in supplying goods after this country assumed charge of the customs of the island, immediately set up plants in Cuba and are doing a big business. The cement business is very good there, and Havana offers fine opportunities for the cement machinery trade. Most of the houses in the residential district were one story in hight before the American invasion, and now there are two-story buildings in plenty and even some "Cuban skyscrapers" of three and four stories are going up. The money which formerly poured out of the island into Spain is staying in Cuba now, and the result can be easily noticed. In some classes of machinery the Germans and English have excelled American manufacturers, and this is especially so with alcohol burning engines. The Germans have met with great success with that class of power production, and they are selling many of them in Cuba, some as large as 50 horse-power. Because of the scarcity of coal and cheapness of alcohol the latter engines are given preference, and the engineering firm which the former Director General represents recently installed lighting systems in two Havana prisons and other municipal buildings, the power for which was derived from alcohol engines. It was declared that a feature of the success of the Europeans is that they do not press purchasers for money, and as the financial barometers of the island are the crops, it is considerable of an advantage to the purchaser there to get easy terms regarding payments. The Americans desire to turn their money over quickly and accordingly their terms do not always please prospective purchasers. Locomotive manufacturers in this country have been getting a good deal of business from the island, and Mr. Primelles declared the superiority of their product over European locomotives is admitted by the Cubans. Shipping facilities of Havana harbor are being improved and there is a general disposition throughout the island to develop its industrial advantages. Important machinery is being installed in many of the sugar refineries and there are numerous plans for enlargement along those lines. The Germans, who control most of the sugar machinery trade, have lost much of it to their American competitors, and Mr. Primelles declared that that class of equipment has been greatly improved by manufacturers in this country, and consequently they are getting a large portion of business. The roads throughout the island are being bettered and there is a general industrial boom on that means much business for machinery houses. The firm of C. Hemple is a general engineering company and it constructs and equips plants for all branches of manufacture, as well as undertakes general construction work of any kind. With a view of getting a general representation of American machinery of all kinds for the engineering firm F. & J. Meyer are anxious to obtain catalogues of all descriptions and wish to get in communication with American machinery manufacturers in all branches.

To Build Railroads in the Philippines.

Plans are under way for the construction of a new system of railroads in the Philippines, which is to be built by private American capital under concession granted by the Insular Government, and which it is estimated will cost $30,000,000. The system covering the islands of Panay, Negros and Cebu will be financed and built by a New York syndicate composed of Cornelius Vanderbilt, J. G. White & Co., William Salomon & Co. and associates and J. G. White will be the leading factor in the engineering part of the enterprise, and in that capacity will from time to time purchase considerable construction equipment. There will be included in the system about 400 miles of track, almost equally divided among the three islands, and the construction will include machine shops, repair stations and all that goes to make a first-class steam railroad system of that size. The organization of the Pioneer Corps for the construction of the railroads is practically complete, and the first division sailed for Manila from Seattle on April 29. The chief engineer of the Philippine railroads is Edward J. Beard, formerly principal assistant engineer of the Rock Island system. The party which left Seattle to put themselves under his command included 50 engineers, among whom were many selected for their experience in the projection of railroads and engineering enterprises on the frontier of civilization, while the rank and file is composed principally of young engineers selected from the railroad field of the West. Among the more prominent members of the party are P. H. Ashmead, H. F. Howe and C. H. Farnham, who were recently connected with the Canton-Hankow Railroad development in China. J. M. Robinson, who has been locating engineer of the Quayaquill & Quito Railroad through the Andes in Ecquador, and L. E. Bennett, who was assistant to Governor Taft in outlining the transportation plans for the Government in the Philippines and previously was consulting engineer to the Emperor of Siam on railroads and irrigation. The company proposes to fill all the minor positions in the work of survey with native Filipinos and the work of construction will be done by native laborers. For locating purposes the Pioneer Corps will be divided into five sections, three for Panay and one each for Negros and Cebu. Work will be begun at once on the three islands, but the operations on Panay will be pushed to completion first. J. G. White & Co. have been doing considerable engineering work in the Philippines, which includes harbor improvement in Cebu and Iloilo and a large coaling station at Olongapo, Subig Bay, which will consist of six coaling units practically in duplicate, a large coal storage shed and elaborate coal handling apparatus with a capacity of 400 tons an hour. Each unit will cost $500,000. A large part of the machinery outfit for the railroad project will be made up from the extensive construction plants owned by the company on the island and in use on the improvements now under way. There is still much to be bought, and as the American interests of the company are handling the project it is safe to say that a large proportion of the purchasing will be done in the New York districts, and the machine shops and similar plants will undoubtedly be equipped through the New York office of the company, although those details will not be gone into yet.

The Havana Central's Plans.

The work of building a trolley system which will extend out of the city of Havana, Cuba, to outlying towns, which is being done by the Havana Central Railroad Company, whose main offices are at 52 Broadway, New York, is well under way, and although that company has been a heavy purchaser of machinery since the project was begun last fall, those who are familiar with the company's undertaking in Cuba declare that there remains much in machinery equipment to be bought. The company is laying 120 miles of single track for a line which will be used for freight and passenger service for the transfer of perishable product for export. In connection with the line the company has begun the construction of a large dock in Havana, under concessions obtained from the Government, which will be equipped with conveying machinery and other apparatus used in transporting freight from cars to boats. The dock will be up to date in every particular and considerable power will be required to operate the extensive machinery equipment with which it will be fitted. Heretofore perishable freight, which is a large factor in Cuban export business, has been conveyed to Havana by wagon and loaded on vessels by small boats, and as the traffic in that connection has been extensive the dock will necessarily be a large one. The company's plans include the construction of a power house and machine shop and the indications are that its lines will be extended considerably more than the present plans call for.

Machinery men in the metropolitan district have received copies of the improved specifications for the construction of the electric light and power system at Fort Wood, N. Y., which work is being readvertised by the Government, other specifications which were sent out about a year ago having been discarded. The requirements include two 80 horse-power externally fired brick set return tubular boilers, one boiler feed pump, one composite inspirator and appurtenances, two 35-kw. direct connected direct current compound wound generators with regulating devices, &c.; two 56 horse-power tandem compound engines, two 150 square foot surface condensers with air and circulating pumps, circuit breakers, ammeters, a number of watt meters, arc lamps and other electrical fixtures. Bids will be received at the office of the Quartermaster-General, U. S. A., on June 1.

The American Locomotive Company has completed negotiations for the purchase of more than 50 acres of land near its Brooks works, at Dunkirk, N. Y., and the trade will probably soon learn details regarding the extensive improvements to be made there. Beyond stating that the company contemplates making additions at Dunkirk, the officials are not yet ready to tell about the plans. The corporation is also preparing to make additions to its plant at Richmond, Va. Plans have been filed with the building department there for a 134 x 162 foot addition to its plant and it will probably be used for manufacturing steam shovels.

Consular Agent Alcock writes from Huelva, Spain, that the authorities there are to erect eight electric cranes on the new pier now in course of construction. Bids are invited from manufacturers of every nation for the construction of these cranes. Heretofore this kind of work has been in the hands of Belgium and Holland. Full details, with copies of specifications, may be obtained from W. J. Alcock, American commercial agent at Huelva. Plans and specifications may also be consulted at the Bureau of Manufactures, Washington, D. C.

A warehouse to cost $125,000 is to be erected at 371 to 375 Greenwich street by the Fisher Realty Company, and Clark & MacMullen, engineers, at 20 Broad street, are taking bids on the following direct connected motors to be added to the machinery equipment: One 2 horse-power, one 3 horse-power, one 7½ horse-power, two 10 horse-power, three 15 horse-power, one 20 horse-power and two 28 horse-power.

The Case Mfg. Company has, through its New York office at 85 Liberty street, received a contract for a 25-ton 24-foot span three motor electric crane, for installation in the plant of the Lehigh Valley Traction Company at Allentown, Pa. The Case Company has also sold two 1½-ton jib cranes to the Pennsylvania Railroad for its Trenton shops.

C. T. Wills, 156 Fifth avenue, has been awarded the general contract for the erection of a 12-story building, 75 x 140 feet in size, on the northwest corner of Broadway and Warren street, to be known as the Gerry Building, and the machinery requirements call for two high pressure boilers and three 225-kw. generators.

Business Changes.

The Lunkenheimer Company, Cincinnati, Ohio, large manufacturer of high grade engineering specialties, opened a well equipped branch store at 66-68 Fulton street, New York, May 1. Previous to that the company maintained a suite of offices in the Havemeyer Building, 26 Cortlandt street, through which the export trade was transacted. While the trade in New York and Eastern States was able to a great extent to procure Lunkenheimer engineering appliances from the various supply houses, nevertheless the increased demand for these specialties necessitated the opening of a branch from which the supply houses and trade in the New York territory could be instantly accommodated.

Benj. F. Kelley & Son, manufacturers of the improved Berryman water tube feed water heater and purifier, have moved their New York offices from 91 to 120 Liberty street.

The Watson-Stillman Company has moved its New York office from 46 Dey street to the Havemeyer Building, 25 Dey street and 26 Cortlandt street.

The Ohio Brass Company, Mansfield, Ohio, has moved its New York offices from 108 Fulton street to 43-49 Exchange place.

Catalogues Wanted.—F. & J. Meyer, 116 Broad street, New York, desire catalogues in all branches of machinery manufacture, with a view to establishing connections for trade with Cuba.

The Tuttle & Bailey Mfg. Company, 83 North Tenth street, Brooklyn, N. Y., would be pleased to receive catalogues of metal and wood working machinery, foundry appliances and general supplies. Catalogues should be addressed to department "G."

Philadelphia Machinery Market.

PHILADELPHIA, PA., May 8, 1906.

A great deal of anxiety has been removed by the coal strike settlement, and business conditions, as far as they were subject to that influence, can now be taken up without fear of interruption for at least three years. A large amount of business has been held up during the last three months pending the probability of a strike, and in the coal mining territory it has virtually been at a standstill. Notwithstanding coal strike conditions, business in the local market during the past week has been fairly active. The demand continues to be largely for tools of the medium sizes, although here and there a sale of one of the larger types has been made. There are quite a few propositions which are now expected to come before the trade at an early date, but none of these are for extraordinarily large equipments.

Manufacturers continue well filled up with orders. The day to day business has been sufficient to take about the daily capacities of their plants, and it has therefore been impossible to catch up on delayed deliveries to any extent. Inquiries are reported as being more numerous. Prices on the whole are stronger. The foreign demand remains unchanged. Manufacturers transacting a more or less regular business in machinery specialties report better sales, but the demand for machine tools of the standard types is not very active.

The demand for boilers and engines is good. Some further sales of those of the higher capacities are said to have been made, principally for power station equipment. Sales of those of the medium horse-powers have not been as active, while the demand for small engines and boilers continues weak. Second-hand machine tools have sold well during the past week. There has been a good demand for those of the larger sizes, particularly if they can be had in good condition. Small tools are not in as active demand. There has been practically no change in the foundry conditions, both Iron and Steel foundries being busy. Machinery castings, particularly in gray iron, on which deliveries have been somewhat delayed recently, can now be had fairly promptly.

The various bureaus of the City of Philadelphia are asking for bids on supplies, equipment, &c., among which the following may be noted: The Department of Supplies, Robert Grier, director, room 312, City Hall, will receive bids until May 14 for brass globe valves, cast steel flanged valves and tees, condenser packing, copper condenser tubes and a five horse-power, two-phase A. C. motor, 220 volts. The Department of Public Works, Thos. L. Hicks, director, will receive bids until June 4, under contract No. 70, for furnishing and laying the Torresdale distribution system, comprising approximately 23 miles of 48-inch cast iron or steel water pipe, specifications regarding which can be obtained at the director's office, 710 City Hall.

The Baldwin Locomotive Works has purchased the plant of the late Gruson Iron Works at Eddystone, Pa. This plant will be immediately put in operation, making gray iron castings. It is fully equipped, having two air furnaces and a cupola and modern foundry appliances. The Baldwin Works will install another cupola, which has already been purchased, and anticipates being able to make eventually at the new plant all the gray iron castings which it has heretofore been compelled to have made at outside foundries. Work is progressing favorably on the new truck shop, building at Seventeenth and Buttonwood streets. It has been decided that internal combustion oil engines will be used to furnish the power for this shop. Regarding the equipment of tools for this shop, we are informed that as the particular needs for truck building will be floor space, but little will be required in the way of machine tool equipment except drilling machines and minor tools, the quantities of which to be brought have not yet been decided upon.

The Standard Pressed Steel Company is taking on a large volume of business, that of the past month exceeding by far any previous one in its history. The demand for the American Pioneer pressed steel shaft hangers from the foreign as well as domestic field is increasing rapidly, and the orders taken keep the plant running at full capacity. Extensive shipments for export have been recently made to parties in Australia, Honolulu, France, England, Canada and Peru, while domestic deliveries are being made to all sections of the country. A recent notable equipment for one concern in Chicago, Ill., required 382 hangers, nearly all of which were of the larger sizes.

The Espen Lucas Machine Works reports business in a very satisfactory condition. Inquiries have been good, and a large number of orders for cold saw cutting off and other machine tools have been booked. All departments of the plant are being operated at the best capacity, and deliveries on steel foundry, bar, I-beam and special saws for sawing steel alloys have been made to parties in different sections of the country. A special crank shaft forming machine has also been shipped to the Albany Forge Company, Albany, N. Y.

H. B. Underwood & Co. are busy in all departments. Inquiries are being received in good volume, both railroads and individual concerns buying tools in larger quantities. Recent orders include three large boring bars for shipment to Mexico, several extra long special bars for parties in the Pittsburgh territory, and portable lathe attachments, facing machines, rotary planers, &c., for concerns in various parts of the country. Deliveries have been numerous, and include portable tools of various kinds to railroad shops in the Southern, Western and Middle States territory. A special portable engine has also been furnished parties in Mabile, Ala.

The Williamson Brothers Company, Philadelphia, Pa., is building an addition to its foundry, 80 x 135 feet, and is extending the crane runways. The company proposes to install an additional overhead electric traveling crane. An additional cupola has recently been installed.

The American Pulley Company is busy. There has been a fairly even demand for pulleys and pressed steel specialties from both foreign and domestic sources, and all departments of the plant are being operated to their full capacity. Four carloads have been shipped to meet the demand on the Pacific Coast, while deliveries for export include shipments to New Zealand and Australia, as well as to Paris and other points in continental Europe.

New England Machinery Market.

WORCESTER, MASS., May 8, 1906.

Quite naturally the prevailing topic in the machinery trade in Boston and elsewhere in New England is the outcome of the Atlantic City meeting of the National Machine Tool Builders' Association. The advance in prices is discussed freely, and with some difference of opinion as to the effect upon the demand for the machine tools included, comprising lathes, planers, shapers and upright drills. But among the dealers the matter of prices is secondary in interest to the action of the association in several matters pertaining to the business relations of manufacturer and dealer. The question of an increase in discount to dealers from 10 to 12½ per cent. was referred by the association to its several sections for their individual, independent action. This is considered by the dealers to be equivalent to letting the matter drop, at any rate, until the next meeting of the association in October, when the effort will be made again to persuade the association to make the increase asked for by the National Supply and Machinery Dealers' Association and its members.

Coupled with the action on the question of discounts was the vote of the National Machine Tool Dealers establishing a new basis of sales by manufacturer to dealer, and at the same time by dealer and manufacturer alike to the customer. This new basis is 30 days net, thus eliminating all discount for cash, which has been in almost universal use in the past. The purpose of the association was to establish some sort of uniform basis. In practice the rule must of necessity have a considerable elasticity, for cases arise not infrequently where it could not be rigidly applied. As one prominent machine tool builder expressed it to-day, the question must come down to "30 days from what?" It cannot always be the date of shipment, on the basis of f.o.b. the shops of the builder, for it will sometimes happen that the whole 30 days will be consumed before the machine reaches its destination, because of distance or of delay en route. Then, again, customers are apt to insist that the machine be tried out in their works before acceptance, a privilege too often abused. The new rule will breed complications to be solved as brought out by the application of the rules of common sense.

Some of the dealers look upon the rule as meaning an additional hardship by compelling payment by them in 30 days, when too often they will have to wait much longer than that for payment from their customers. Other dealers consider the rule a wise one, in that it will be the means of compelling earlier payments by customers. In cases where the buyer cannot pay immediately, when he requires more extended credit and gives his note, that instrument will bear interest from an earlier date than under existing rules. It should be borne in mind that existing contracts between manufacturer and dealer cannot be vitiated by the vote of the National Association, and that when new contracts are made this matter of conditions will be gone into by the two interested parties to their mutual satisfaction, it is to be hoped.

The advances in prices of machine tools, so far as made, comprising lathes, planers, shapers and upright drills, will not affect the bank accounts of either manufacturer or dealer for some time to come, because deliveries under the new schedule cannot begin for a material period of time on all classes of tools, and for any way from six months to more than a year on many classes and sizes. The market will be watched with keen interest to learn if the change in price will influence buyers.

Manufacturers are regretting that the Saturday half holiday has been established as a custom for the summer months. With business in its present condition they cannot shut down their works half a day a week without a certain real loss, which is especially difficult to contemplate with equanimity where orders are far behind. Yet it looks to be a difficult matter to refuse the request of employees for a continuance of the custom which means a great deal to them. Probably in some instances the season of the half holiday will not be so long as usual. Fewer works will shut down for several weeks with the combined intention of giving employees a vacation and making complete repairs.

The long expected list of tools for the new locomotive repair shops of the New York, New Haven & Hartford Railroad will probably be out this week. The list is a long one, comprising the full range of equipment for one of the largest shops of its kind in the country. The orders for cranes have already been placed through Manning, Maxwell & Moore, the Shaw type having been selected. Manufacturers and dealers alike are anxious to know how the plums will be apportioned, the business being especially prized from the fact that deliveries need not be hurried, work on the shops having only just started.

The Boston office of the several companies owned by the

International Steam Pump Company will be removed from 54 Oliver street to 42-48 Batterymarch street. The companies include the Henry R. Worthington Steam Pump Company, the George F. Blake Mfg. Company, the Knowles Steam Pump Company, Deane Steam Pump Company, Snow Pump Company, Laidlaw-Dunn-Gordon Company and the Clayton Air Compressor Company.

Clayton Bros., scissors manufacturers, Bristol, Conn., are to erect a small foundry for manufacturing gray iron castings for their own use. All necessary equipment has been purchased.

The O. K. Tool Holder Company, Shelton, Conn., manufacturer of lathe, shaper and planer tools and drop forgings, has been compelled to erect a plant of its own, the present quarters having become inadequate to the needs of the rapidly growing business. The new machine shop will be 40 x 75 feet and four stories, and adjoining it will be a steel drop forge shop, about 50 feet square. Both buildings are designed with a view to extending them when the demands of the business shall require it, the company's property being entirely adequate to permit of a large growth. The site is excellent, one side of the lot facing on the dock, the other on the railroad. The business is a young one, but its growth has been remarkable, as is evidenced in the fact that in the year ending April 1 last the business of the preceding year was just doubled.

The new Waterbury Rolling Mills Company, Waterbury, Conn., which will manufacture specialties in metal alloys for jewelers' metal, chains, &c., has perfected organization with the election of the following officers: President, Ambrose H. Wells; vice-president, Abel Kenworthy; secretary, F. B. Beardsley; treasurer, F. P. Welton; assistant treasurer, M. E. Keeley. The work on the new plant, plans for which have already been given in this column, will begin shortly, the officers state.

The Springfield Foundry Company, Springfield, Mass., manufacturer of iron castings, is to erect a large foundry on the tract of land owned by the company on Albany street. The building will be 110 x 280 feet and will contain the most modern foundry equipment. The present foundry on Liberty street will not be abandoned when the new building is completed, both plants being necessary to take care of the growing business. The cost of the new foundry will be between $80,000 and $90,000.

F. N. Manross, Forestville, Conn., manufacturer of hair springs, is to increase his plant and will install a gas engine and electric generating equipment. Electricity will be used for fine tempering as well as for the usual purposes.

The Ashcroft Mfg. Company, Bridgeport, Conn., is to erect a four-story brick and steel addition, 50 x 300 feet. A new electric generator will be installed.

The La Pointe Machine Tool Company, Boston, Mass., is to remove its business from 32 Atlantic avenue, that city, to Hudson, Mass., where it is the intention to erect a new building for the purposes of the company.

The Crosby Steam Valve & Gauge Company, Boston, has increased its capital stock from $100,000 to $500,000, and this has led to the report that the company is to extend its works. Such is not the case. The company has capitalized a large part of its surplus. This means no change of any sort in the business.

A company is being organized at Ryegate, Vt., to establish and operate a power plant, developing a large water power. It is proposed to expend $40,000 on the plant, which will supply the Wells River Valley with electric power. M. F. Sargent, South Ryegate, Vt., is one of the promoters of the plan.

The probability is that the Charlestown Navy Yard will not be so heavy a buyer of machine tools as in other recent years, for under the agreement between the joint committees of Congress only $95,000 is given the yard for improvements. Plans are prepared at Washington for a $25,000 addition to the anchor and chain shed for the manufacture of anchor chain and forgings. The building will be 40 x 200 feet. A three-story addition to the wire rope mill, 50 x 120 feet, will also be erected this season, and a large addition to the yards and docks power house will be built, these improvements being from appropriations already made, with the exception of the power house. Nothing in the building programme included in the bill now before Congress indicates the purchase of machine tools or other machine equipment, excepting power.

The George Q. Hill Company, Boston, Mass., has moved its office and shipping department to 170 Purchase street, which provides for a needed enlargement of both departments.

Gas distribution over a large area for domestic and other purposes is undertaken by the Western United Gas & Electric Company, with headquarters at Aurora, Ill. Consumers to the number of nearly 20,000, in 25 cities, towns and villages, for which pipe lines aggregating 431 miles in length are required, are served by this one company. The aggregate population of these communities is 140,000, and the greatest distance between any two of them is 52 miles.

Springfield and Columbus Machinery Trade.

CINCINNATI, OHIO, May 7, 1906.

A visit to the machine tool industries of the cities of Columbus and Springfield, Ohio, reveals the fact that with scarcely an exception they are crowded with work and are striving to make deliveries as rapidly as possible, most of them, however, being from two to three months behind in this respect. As a further indication of the extent of the business being handled we find a large percentage of the concerns visited are considering the advisability of increasing the size of their plants, either by adding equipment and utilizing all available space or by the erection of other buildings, thereby gaining the same end.

The scarcity of skilled mechanics is quite as apparent in these cities as in Cincinnati, and it seems to be a very difficult problem to secure competent help that is at all of a permanent character. The foreign demand is exceptionally active, and it is, indeed, a matter of surprising interest to learn of orders that are received from points on the other side of the globe, where it can scarcely be imagined such tools would be in requisition. The labor situation, taken as a whole, is quite satisfactory, one or two exceptions, however, being noted among several of the larger concerns employing molders. These were said to be of a minor nature, however, and would probably be settled in a few days. Many of the tool builders note the fact of the tendency toward heavier machinery, and efforts are being made to secure the end sought in bringing out tools of this character, efficiency and durability consistent with cost being duly considered.

Both of these cities have unsurpassed railroad facilities, manufacturers being able to locate their plants on the very outskirts of the city, where space is more readily accessible, and at the same time derive all the benefits of more centrally located industries. Trade along structural lines is on the increase, and there are a number of large and commodious structures being erected for factory and other purposes.

Springfield.

One of the largest plants of the city will be that of the Farmers' Co-operative Harvesting Machine Company of Springfield, which city, by the way, ranks third among the agricultural implement producing cities of the country. Here a site has been chosen, comprising about 100 acres. Several buildings have already been erected and are now in operation. A portion of the equipment has been installed, but several other buildings are to be added, necessitating further purchases of tools.

The Springfield Gas Engine Company reports business excellent, with its product taken up as rapidly as it can be manufactured. The year promises very satisfactory results, trade thus far being far ahead of what it was last year. Present equipment is being crowded to its utmost in order to make contract deliveries.

The Western Tool Mfg. Company, manufacturer of tool holders, Champion expanding mandrels and portable vise and tool stands, has recently installed a new 15-inch Warner & Swasey lathe and a drill press made by the Cincinnati Machine Tool Company. Trade is moving in such a brisk manner that a new building, 90 x 100 feet, is to be erected, which will about double the capacity of the present plant. A blacksmith shop will also be added and everything done that is possible to increase present output. Foreign inquiry is said to be excellent.

The Foos Mfg. Company, manufacturer of standard and special grinding and crushing machinery, reports a steady growth of business, especially with the Southern States. During the past few months a number of changes have been made in equipment, and plans are now under way to increase the foundry department, as this part of the plant is very much congested.

The Owen Machine Tool Company has expanded considerably during the past few months. The plant is now being equipped with a number of labor saving devices and a general air of bustle pervades the entire works. A Norton grinder, Gisholt turret lathe and several smaller tools have recently been added to the equipment. A traveling overhead track with switches connecting to the tools of the shop has been built, which allows the individual machinist to handle his allotment of work without additional help. The volume of trade has developed to such an extent that plans are now being arranged for extending the present building 250 feet north. This addition will give about three times the capacity of the plant as it exists to-day and enable the company to keep in closer touch with the trade. The plant is now working full force until 9 p. m. daily, with about 40 per cent. of the trade coming from foreign points. A number of changes are being made in the building of its tools, especially as regards stiffening them, in order to meet the requirements of high speed steel. The output of the plant for last month was about treble that preceding, and May is expcted to show still larger gains.

The Robbins & Myers Company say that business is at least 60 per cent. greater than it was last year. A Warner & Swasey screw machine and lathe have recently been in-

stalled and the company is now in the market for three other lathes of various dimensions. A building, 25 x 265 feet, has been added to the electrical department, and another, 65 x 85 feet, to the foundry, but with these increased facilities it is impossible to produce sufficient machinery to fill orders. South America is proving to be an excellent market for the product of this company and a large number of shipments have already been forwarded. A carrier system for carrying iron and delivering castings to the cleaning room is now being installed, which will geatly facilitate the handling of heavy machinery. A specialty is made of light gray iron castings along scientific lines.

Columbus.

The Ralston Steel Car Company is planning to increase its shop capacity, as it is a matter of physical impossibility with present facilities to meet the demand of trade. The output of ten cars per day for a period of two years is practically contracted for, and there is no possible way of meeting extra contingencies that may arise other than by materially increasing the size of the present plant. This company is now in the market for an air compressor of about 1800 cubic feet per minute and of 100-pounds pressure, four electric traveling cranes of 5, 10 and 20 tons capacity, four small drill presses, an 18-inch tool room lathe and several punches and shears.

The Columbus Forge & Iron Company has recently installed an 8000-pound hammer and a 42 inch x 34 foot rough turning lathe, thereby greatly adding to its specialty along the line of heavy forge work. This department is to be expanded as rapidly as possible, as well as the making of drop forgings of all kinds.

The Columbus Machine Company ships a large amount of its product to points in Australia for use of the sheep shearing trade. During the past year or two an entire line of new equipment has been installed, and the plant is now in excellent condition to take care of trade offering.

The Chase Foundry & Mfg. Company is increasing the size of its plant by the addition of a building, 40 x 65 feet, that is to be used for office and warehouse purposes. Considerable delay is reported on account of the inability of getting structural iron as rapidly as desired, and the result is the company is far behind in deliveries.

The Buckeye Steel Castings Company is enlarging the capacity of its plant by the addition of a large open hearth furnace. A month or two ago a similar furnace was installed, which gives four active furnaces, with one in reserve. The output of these four furnaces is about 3000 tons of castings per month. Another power unit is also being added to the plant, all of which means a large increase in output. Considerable difficulty is experienced in securing competent help, which to this company is an exceedingly vexatious proposition, as it employs a large number of men.

The Baldwin Forging & Tool Company has added considerable machinery to its plant recently. An order has been received through Woodward, Wight & Co., New Orleans, for 300 dozen shovels, to be forwarded for work on the Panama Canal. Trade generally is reported to be very satisfactory.

The Ohio Tool Company has been adding some new machinery to take care of a new line of planes that has recently been put on the market. Foreign trade with Great Britain and Australia is reported to be very good.

The Case Mfg. Company, builder of electric and hand cranes and hoists, says that trade is very satisfactory, and is quite general throughout the country. One special feature is particularly noticeable in orders that are coming forward, and that is the large majority of them call for cranes of larger capacity than formerly. There is quite a large demand for the new style of alternating current cranes which the company has recently placed on the market.

The New American Elevator Company, which has been in the hands of a receiver since last June, and which has been idle since that time, is about to be sold for the benefit of the creditors. On May 22 the receiver will offer at public sale all of the office furniture and fixtures, with a full equipment of tools, consisting of lathes, shapers, drill presses and 100 horse-power New York Safety steam engine, together with the buildings and grounds.

The Jeffrey Mfg. Company, manufacturer of coal mining machinery, elevating machinery and electric locomotives, has recently secured control of the Haven stoker for stationary, marine and locomotive work. One is now in use at the plant and is proving entirely satisfactory, and it is anticipated that within the next few weeks it will be in shape to be placed on the market.

Cincinnati.

The trouble between the molders and employers has been satisfactorily adjusted, and the employers have agreed to concede the nine-hour day without reduction in wages, the men waiving the demand for a slight advance over the old rates. Under the new schedule floor molders will be paid $3.20, bench molders $3 and core makers $2.75 per day.

The Water Works Commissioners have awarded contracts to Dravo, Doyle & Co., Pittsburgh, for two electrical generators at $8650, two centrifugal water wash pumps at $5235 and two centrifugal flushing pumps at $5950. The firm of J. Clark & Co. of this city has received the contract for electric lighting machinery at its bid of $3300.

The Butler Foundry Company, Hamilton, Ohio, capital $10,000, has been incorporated by Louis A. Flume, Charles C. Friebel, B. M. Fuersich, Geo. J. Fuersich and Henry Schuhaus.

Schumacher & Boye, Cincinnati, builders of engine lathes, have purchased the ground on which the Dreses Machine Tool Company's plant formerly stood and which immediately adjoins their present shop. They will proceed at once to enlarge their plant by the erection of a modern steel-concrete building, fronting 75 feet on Buck street and running back 200 feet. In addition to this machine shop a new power plant, 63 x 100 feet, will be erected, making a total frontage on Buck street of 175 feet and running 360 feet in the rear. The new addition will be of the most approved factory design and is to be equipped with the latest tools. This means that the capacity of the present plant will be approximately doubled, which in connection with contemplated changes that are to be made in the office and warehouse building fronting on Spring Grove avenue, will make it the largest exclusive lathe manufactory in the West.

Government Purchases.

WASHINGTON, D. C., May 8, 1906.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until May 22 for the following machine tools for the Portsmouth, Boston and Norfolk navy yards: Pneumatic punches, lathes, index centers, molder, drill presses, forming press, turret lathe, steam hammer, die sinker, trimming press, electric deck planers, shears, pipe expander and metal saw.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until June 5 for the following machine tools for the Mare Island Navy Yard: Lathe, molding machine, gear shaper, milling machine, helve hammer and die sinking machine.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until May 22 for a quantity of supplies for the Mare Island and Puget Sound navy yards, including motor, &c.

The following bids were opened April 20, circular No. 304, for supplies for the Isthmian Canal Commission:

Bidder 1, Alberger Condenser Company, New York; 9, Brown Hoisting Machinery Company, Cleveland, Ohio; 10, Browning Engineering Company, Cleveland, Ohio; 11, Edwin Burhorn, New York; 13, Wm. Wirt Clark & Son, Baltimore, Md.; 16, Dodge Coal Storage Company, Nicetown, Philadelphia, Pa.; 19, Fox Bros. & Co., New York; 20, Gardner-Governor Company, Quincy, Ill.; 22, Deane Steam Pump Company, New York; 31, Industrial Works, Bay City, Mich.; 34, E. Keeler Company, Williamsport, Pa.; 47, Manning, Maxwell & Moore, New York; 48, J. H. Menge & Co., New Orleans, La.; 54, Motley, Green & Co., New York; 55, John H. Murphy, New Orleans, La.; 56, National Pipe Bending Company, New Haven, Conn.; Oil City Boiler Works, New York; 59, Pennsylvania Boiler Works, Erie, Pa.; 60, Phœnix Iron Works, New York; 61, Platt Iron Works Company, Chicago, Ill.; 68, H. A. Rogers Company, New York; 77, Walsh & Weidner Boiler Company, Chattanooga, Tenn.; 79, Wellman-Seaver-Morgan Company, Cleveland, Ohio; 84, A. D. Granger Company, New York; 85, Occidental Machinery Company, San Francisco, Cal.

Class 1. Four locomotive cranes—Bidder 9, $34,104; 10, $25,200 or $28,900; 16, $37,400; 31, $26,200; 79, $36,400 and $34,800.

Class 2. Four locomotive cranes—Bidder 9, $46,800; 10, $33,300; 31, $35,088.

Class 3. Four hydraulic jacks—Bidder 13, $1679.50; 19, $1580.76; 47, $1541.64; 68, $1455.

Class 4. Six tubular boilers—Bidder 11, $10,488; 19, $11,628; 34, $11,640; 47, $12,165.30; 54, $11,010; 55, $13,055; 58, $16,554; 59, $12,000; 60, $8346; 77, $12,500; 84, $9372 and $10,597; 85, $16,689.

Class 6. Three feed pumps—Bidder 13, $914.10; 19, $1017; 20, $1020; 22, $717.33; 47, $978.75; 48, $991.50; 55, $1629; 61, $930; 85, $1339.80.

Class 7. Three water heaters—Bidder 1, $1920; 19, $1572; 47, $1997.55; 56, $2751 and $2175; 85, $2865.

Class 11. Test and testing pumps—Bidder 3, $483.80; 19, $450; 47, item 3, $136.89; item 15, $23.04; 82, item 13, $180; item 15, $27.80; 83, item 13, $147; item 15, $24.75.

The following bids were opened April 24 for supplies for the navy yards:

Bidder 16. George F. Blake Mfg. Company, New York; 27, Contractors' Supply & Equipment Company, New York; 32, Wm. Wirt Clark & Son, East Baltimore, Md.; 33, Charles Cory & Son, New York; 44, M. T. Davidson, Brooklyn, N. Y.; 48, Frye, Phipps & Co., Boston, Mass.; 85, J. B. Kendall, Washington, D. C.; 100, Manning, Maxwell & Moore, New York; 104, Montgomery & Co., New York; 105, Municipal Engineering & Contracting Company, Chicago; 119, National Concrete Machine Company, Chicago, Ill.; 134, S. M. Price

Machinery Company, Norfolk, Va.; 136, Ricketts Engineering Company, Washington, D. C.; 137, J. B. Roache, Brooklyn, N. Y.; 140, H. A. Rogers Company, New York; 147, Sanson & Rowland, Philadelphia, Pa.; 148, Sherman-Brown-Clements Company, New York; 184, Bigelow & Dowse Company, Boston, Mass.; 191, Lumley-Dodson Company, San Francisco, Cal.; 194, Henshaw, Bulkley & Co., San Francisco, Cal.

Schedule No. 440.

Class 1. One improved cube batch concrete mixer—Bidder 27, $800; 32, $706.50; 105, $950; 112, $663; 119, $500; 136, $638.

Schedule No. 441.

Class 11. One vertical direct acting single piston steam pump—Bidder 16, $418.50; 33, $515; 44, $360; 194, $448.

Awarded to bidder 44.

Schedule No. 454.

Class 122. Two steam pumps—Bidder 16, $86; 32, $109.80; 44, $90; 191, $120.

Awarded to bidder 16.

Schedule No. 455.

Class 141. Twenty-four hydraulic jacks—Bidder 32, $995.88; 48, $942; 85, $1020; 100, $899.64; 104, $973.20; 134, $970.80; 137, $881.40; 140, $934.68; 147, $971.76; 148, $946.80; 184, $972.

Awarded to bidder 137.

The following bids were opened April 21 for mechanical equipment for the new municipal building in Washington, D. C.:

Thomas & Smith, Chicago, Ill., $76,506; deduct if generators are not required $13,708.

Evans, Almiral & Co., New York, $75,934; deduct for generators $13,708.

D'Olier Engineering Company, Philadelphia, Pa., $77,850; deduct for generators $12,800.

C. H. Sanborn, Boston, Mass., $71,937; deduct for generators $14,240.

New York Steamfitting Company, New York, $73,000; deduct for generators $16,700.

Thompson-Starrett Company, New York, $92,000; deduct for generators $16,000.

C. H. Bashon, Baltimore, Md., $18,900; deduct for generators $16,000.

Hubbard Heating Company, Washington D. C., $82,966; deduct for generators $14,062.

Hanley-Casey Company, Chicago, Ill., $73,400; deduct for generators $14,500.

Muralt & Co., New York, $86,830; deduct for generators $13,970.

The following bids were opened April 23 by the Isthmian Canal Commission for two seagoing suction dredges for Cristobal and La Boca:

Union Iron Works, San Francisco, Cal., one dredge for La Boca, $500,000, delivered at San Francisco; time, 540 days.

New York Shipbuilding Company, Camden, N. J., one dredge each at Cristobal and La Boca, $410,000 each, delivery for each 420 days; if awarded both dredges, $780,000, delivered at Camden, N. J. This price includes services of a guaranteed engineer to accompany each dredge on its trip to destination.

Holland American Dredge Building Syndicate, Schiedam, Holland, two dredges, delivered at Schiedam, Holland, $852,000; one within 365 days, the other 425 days; if delivered at Cristobal and La Boca add $89,000 each.

Newport News Shipbuilding & Dry Dock Company, New York, one dredge each at Cristobal and La Boca, each $460,000; time for dredge at Cristobal 280 days, for La Boca 310 days; delivery at Newport News, Va.

Wm. Simons & Co., Renfrew, Scotland, two dredges, $327,000 each, delivered at Renfrew, Scotland; time for Cristobal dredge 305 days, for La Boca dredge 335 days. If delivered at Cristobal all costs will be paid by bidder exclusive of harbor duties for the additional sum of $17,980 at Cristobal and $34,000 at La Boca.

Maryland Steel Company, Sparrow's Point, Md., one dredge at Cristobal and La Boca, each $366,900; time for delivery, 365 days each; delivery at Sparrow's Point, Md. If award is made for both dredges, $724,850; delivery will be made for one in 365 days, the other in 425 days, at Sparrow's Point, Md.

Motley, Green & Co., New York, one dredge for Cristobal, $425,000, delivered within 425 days; one dredge for La Boca, $465,000, delivered within 485 days; delivery at Cristobal and La Boca respectively. In the event of award being made the dredges will be built by Ferguson Bros., Port Glasgow, Scotland.

Fore River Shipbuilding Company, Quincy, Mass., one dredge each at Cristobal and La Boca, $450,000 each; delivery at works, Quincy, Mass., within 14 months.

Moran & Co., Seattle, Wash., one dredge at La Boca, $435,000, delivery at Seattle in 365 days.

Under bids opened March 6 for machinery for the navy yards the Vandyke-Churchill Company, New York, has been awarded class 1, one pipe cutting and threading machine, $517.

Under bids opened March 20 for supplies for the navy yards the Niles-Bement-Pond Company, New York, has been awarded class 2, one 22½-inch motor driven upright drill, $312.

The following awards have been made for supplies for the navy yards, bids for which were opened April 10:

Manning, Maxwell & Moore, New York, class 32, one N . 6 shears, $174.50; class 95, two 30-ton hydraulic lifting jacks, $105.72; class 166, one boiler test pump, $65.

Manhattan Supply Company, New York, class 133, one buffing lathe for two wheels, $29.

The Niles-Bement-Pond Company, New York, has been awarded class 48, item 149, one bending roll, $2585, by the Isthmian Canal Commission, under opening of February 19, serial number 297.

Under bids opened April 13 for supplies for the Isthmian Canal Commission, circular No. 303, Manning, Maxwell & Moore, New York, have been awarded class 57, four Scotch marine boilers, $13,540.20.

The Bureau of Yards and Docks, Navy Department, Washington, will shortly ask bids for power plant equipment for the Charleston and Norfolk navy yards. There will be required four 400 horse-power water tube boilers, two batteries of 450 horse-power each, four turbo generators or three direct connected reciprocating engines, two of the turbo generators to have 500-kw. capacity each and two of 300-kw. each, three turbo generators, two of 1000-kw. each and one of 500-kw., boiler feed pumps, condensers, motors, pumps, coal handling apparatus, &c.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until May 22 for a quantity of supplies for the Eastern navy yards, including crane and hoist, pumps, &c.

An electric drill is included in the supplies for the Eastern navy yards, bids for which are asked until May 29 by the Bureau of Supplies and Accounts.

The Isthmian Canal Commission will receive bids until May 21 under circular No. 307, for lathes, milling machine, feed water heaters, pumping apparatus, steam pumps and other supplies.

The Bureau of Yards and Docks, Navy Department, Washington, will receive bids until May 26 for two 8-inch motor driven centrifugal pumps for the Portsmouth Navy Yard.

The following bids were opened May 1 for supplies for the navy yards:

Bidder 9, Chicago Pneumatic Tool Company, New York; 16, Drew Machinery Agency, Manchester, N. H.; 23, Fairbanks Company, New York; 37, Hendy Machine Company, Torrington, Conn.; 39, Independent Pneumatic Tool Company, Chicago, Ill.; 41, Ingersoll-Rand Company, ..ew York; 55, Manning, Maxwell & Moore, New York; 57, Montgomery & Co., New York; 60, Niles-Bement-Pond Company, New York; 74, Prentiss Tool & Supply Company, New York.

Schedule No. 484.

Class 71. Two No. 00 direct acting rotary pneumatic drills and five No. 0 pneumatic drills—Bidder 9, $344; 16, $344; 39, $425; 41, $380; 55, $344.

Class 72. Ten Little Giant drills—Bidder 9, $900; 39, $677; 41, $800; 57, $895.

Class 73. One 14-inch drill press with direct connected motor—Bidder 23, $185.

Class 74. One 21-inch back geared drill press—Bidder 23, $137.50.

Schedule No. 485.

Class 102. One 15-inch post shaper—Bidder 37, $390; 55, $380; 60, $370 and $385; 74, $295.50.

Under circular No. 305-F the following bids were opened by the Isthmian Canal Commission May 2:

Bidder 1, Allis-Chalmers Company, Baltimore, Md.; 2, E. G. T. Colles & Co., Chicago, Ill.; 3, Commercial Electrical Supply Company, St. Louis, Mo.; 4, D'Olier Engineering Company, Philadelphia, Pa.; 5, General Electric Company, Schenectady, N. Y.; 6, A. D. Granger Company, New York; 7, Kieley & Muller, New York; 8, Manning, Maxwell & Moore, New York; 9, Motley, Green & Co., New York; 10, Phœnix Iron Works Company, Meadville, Pa.; 11, Platt Iron Works Company, Dayton, Ohio; 12, Ridgeway Dynamo & Engine Company, New York; 13, Ridgeway Dynamo & Engine Company, New York; 14, Wesco Supply Company, St. Louis, Mo.; 15, Western Electric Company, New York; 16, Westinghouse Electric & Mfg. Company, New York; 17, Henry R. Worthington, New York; 18, Buffalo Forge Company, Buffalo, N. Y.

Class 1. Two 160 horse-power tandem compound engines. Bidder 4, $4900; 5, $6160; 9, $5700; 10, $4900; 12, $4750; 13, $7990; 14, $6020.50; 6, $4666 and $5216; 18, $4380.

Class 2. Item 2, two 100-kw. engine type revolving field generators; item 3, one multi-polar compound wound direct current generator. Bidder 1, item 2, $4502, item 3, $1045; bidder 3, item 2, $5500, item 3, $874; bidder 4, item 2, $4700, item 3, $840; bidder 5, item 2, $4000, item 3, $820; bidder 6, item 2, $5260, item 3, $878; bidder 14, item 2,

$4706, item 3, $1512.60; bidder 16, item 2, $4440, item 3, $860.

Class 3. One five-panel switchboard and three a. c. 7200 alternation ammeters. Bidder 3, $1160; 4, $1470; 5, $950; 6, $1490; 14, $1159.25; 16, $1452.

Class 4. Sixty-three transformers. Bidder 3, $2179.76; 4, $2220; 5, $2072; 6, $3457; 14, $2569.25; 15, $2386.25; 16, $2545.

Class 5. Three 120 horse-power vertical boilers. Bidder 4, $5100; 5, $5975; 6, $3710 and $3550; 8, $5556; 10, $4050 and $4850; 17, $4320.43.

Class 6. Two Worthington boiler feed pumps. Bidder 4, $330; 5, $270; 8, $343.50; 11, $168; 17, $158.06.

Class 7. One 350 horse-power feed water heater. Bidder 2, $225; 4, $370; 5, $398; 6, $350; 7, $200; 8, $338; 11, $285.

Ore Shipments Stopped by the Dock Strike.

April Total in Excess of Last Year's.

DULUTH, MINN., May 5, 1906.—As the result of the combination of firemen's and Lake Erie longshoremen's strike for certain recognition of another body of men every iron ore shipping port is ceasing business. Underground mines in general are still busy as ever and are stocking ore with speed, but the Mesaba open pit mines are all idle, all shovels in stocks at other points are down and every iron ore road has cut off its extra equipment and is running road and docks with the smallest crews possible.

April shipments of iron ore through the Sault canals were 1,125,000 gross tons, which is to be compared with 720,400 tons for the same period last year and nothing in April, 1904. From the head of the lakes April shipments this year have been 984,000 tons, against 875,000 the year before, showing that the bulk of the increase this season to date, contrary to expectations, has been from old ranges. The season began at the ore docks on April 14, 1906, and the day before that in 1905.

The big Hoover & Mason ore grab installed at the Grant mine, Mesaba range, is being tested this week and should begin mining surfaces in a short time. The moving parts, grab, &c., and its ore or dirt, will weigh about 45 to 50 tons, supported between towers nearly 1200 feet apart on wire cables.

Mesaba Development Beyond the Mississippi.

Quite a little development is now under way on the western side of the Mississippi River, on the Mesaba range, where the Oliver Iron Mining Company and others have drills at work. There has never been any question that the Mesaba range extended across the river for a considerable distance, but as the drift covers the formation to such a thickness as to obliterate completely all evidences of its presence exploration there has been difficult. It has been undertaken by heavy interests and in a sort of blind manner by feeling out in the probable direction by one exploration after another. What ore has been found is of about the character of that discovered near the river on the east, though it seems in many cases to be of rather lower grade. The possibilities are that a material increase in tonnage may result. Work has been done as far west as 145-23, and a considerable amount of surface prospecting has been carried on this spring, even further west, with some encouragement.

The statement in this correspondence credited to a drill operator that 400 or more drills are working on the Mesaba range, has been extensively copied. As a matter of fact not more than 100 to 125 drills are working on that range and the original figure given was an error, either of the typewriter or the typesetter. Drill work on the range is not as heavy as usual. Well located ground in which to sink holes is hard to get, and has already been pretty thoroughly prospected. The Oliver Iron Mining Company has a number of drills, perhaps a dozen, on and near the Walker lands in 56-24, and the Great Northern has some in that vicinity and further east, which a few independent operators are working along the range. There are a few drills west of the Mississippi river. The work along the eastern end of the Mesaba can be summed up in short order. A good deal is still said by uninformed persons as to work on the Cuyuna range, but the situation as regards this district does not differ from what has been stated in this correspondence for the past two years—that time may disclose some valuable deposits, but is scarcely likely to until the standard for merchantable ore is far different from what it is now, and until, too, there have been enormous shipments of lean ores from the Palmer, Cascade and Menominee districts, which have an important advantage over Cuyuna in freights and are even better than it in the general character of ores disclosed. Reports of iron discoveries in other parts of Minnesota—Morrison County, for instance—are to be taken in the "important if true" class and should have no effect on those looking for mines they can ship ore from.

All shaft sinking on the eastern Mesaba, near Biwabik, has been troubled very much by quicksands. At the Syracuse mine of Pickands, Mather & Co. patent interlocking steel piling was tried, and the shaft, after many discouragements, has almost reached ledge. Cement is being forced down to the bottom through pipes, and this is expected to form a coating around the irregular rock so that bedrock can be reached without trouble.

The small ore deposit of the old Williams mine, adjoining the Biwabik, is being reopened by the Minerva Furnace Company of Milwaukee, and most of its products will go there. It can not ship any large tonnage, and is but a tag end of the Biwabik ore body.

Work on the Menominee Range.

In the Menominee district at Iron Mountain the Dessau company has cut Bessemer ore in its new workings at the Millie end of the Pewabic mine. This ore runs about 50 per cent. iron and the company thinks there is a considerable deposit.

A great deal of work is under way in the district. The Pewabic Iron Company has started its concentrating plant, which has been idle for the past seven years, and proposes to treat a large amount of lean ore that has been unmerchantable for many years. In times past the Pewabic company has experimented extensively with the concentration of part of its ore, and has succeeded perfectly from both the mechanical and metallurgical points of view. The ore treated has been found in small lenticular masses, intermixed with a gangue of sandstone, and the process of concentration is entirely wet mechanical, for crushing and washing out of the sandstone. There is a jaw crusher first, followed by Cornish rolls, and the material is passed through jigs. About a third of the material washed comes out as high grade Bessemer ore.

At the workings of the Antoine Ore Company more men are busy than for a long time. The company now has two large crushers and these are breaking up to from 1500 to 1800 tons a day. A larger hoist is going in and additional ground is being stripped for mining by the milling system.

At the Monroe of the Buffalo & Susquehanna Company, this year's product will be about the same as that of 1905—100,000 tons. This is another open pit. The same company has been given an extension of its option on the Hiawatha, and is to drill the ground, as it has been found impossible to explore the property from the old shaft.

In Crystal Falls the Kimball exploration is being retimbered. The same company is working at the Baker, and has the shaft ledged in a formation that runs about 40 per cent. iron. At the Tobin, also belonging to Corrigan, McKinney & Co., the old Tobin shaft is now used to the exclusion of the Hennepin, which has been the main hoisting avenue for several years. The Fairbanks will make a small output this year.

At Iron River the Winnifred Mining Company, composed of Minnesota men and former officers of the Republic Iron & Steel Company, is developing the Morgan There is far more activity than Iron River has ever seen. It is expected that shipments from Iron River this year will exceed 500,000 tons.

A large shaft will be sunk at the Montreal mine, on the Gogebic range. It will be placed far back in the foot wall. Developments will take place on the western Gogebic, near Upson, this year, where a syndicate has taken options on a number of tracts and will explore them thoroughly.

D. E. W.

New Publications.

Downing's United States Customs Tariff. Revised to January 1, 1906. R. F. Downing & Co., 15 William street, New York. Cloth. Pages, 661. Price, $2 per copy.

This book is of great value to all who wish to obtain information relating to custom house matters. It not only gives the full text of the existing tariff, but articles are alphabetically arranged with the rate of duty on each item and a special reference to the paragraph in the law that describes the article, thus enabling any name to be found with no loss of time. It further contains references to all Treasury Department, United States General Appraisers' and United States Court decisions. The French, Portuguese, German, Italian, Cuban and Swiss reciprocity treaties are among the contents, as well as the Customs Provision Sealing act of December 29, 1897, the Pure Food act of March 3, 1903, and a list of parcels post countries. Tables are given for the conversion of foreign money into United States equivalents.

Valve Gears for Steam Engines. By Cecil H. Peabody, professor of Naval Architecture and Marine Engineering, Massachusetts Institute of Technology. Second edition, thoroughly revised. Publishers, John Wiley & Sons, New York. Pages, 142. Illustrated. Cloth, $2.50.

The original edition of this book was published in 1890, and in its present form it has been made more simple and more easily understandable. A special effort has been made to give directions for solving problems and for making constructions explicit, with the reason for the methods. Another change is the transfer of all analytical work to an appendix, with the object of avoiding discontinuity in the graphical presentation of the work, allowing the reader to choose whether he will take certain general principles for granted or carry his investigations further and in greater detail. All of the illustrations are confined to plates, of which there are some 33, printed on one side of the paper only and bound together at the back of the book. Primarily the book is intended as a text book for engineering students, giving instruction in the theory and practice of designing valve gears for steam engines. It makes no pretense to be an exhaustive treatment of the vast number of valves and gears at present in use, but rather to give the beginner an insight into the principles and their applications. The book is divided into six chapters, treating respectively of the plain slide valve, shifting eccentrics, link motions, radial valve gears, double valve gears and drop cut-off valve gears. Each type is illustrated by one or more examples selected from good practice. Graphical methods are used throughout in the body of the book to demonstrate principles and indicate designs, while analytical demonstrations are given in the appendix for such principles as cannot be completely and satisfactorily treated by construction only. It has been the endeavor to confine the methods and processes treated to those which are firmly established, and the unusual has been purposely avoided. One feature that is believed to be original is the combination of a skeleton model with construction for laying out link motions and other irregular or complicated gears. The work will particularly appeal to those who wish to gain a fundamental understanding of the principles of valve gear design and construction.

One of the surprising things which were recently brought to light in connection with some airbrake experiments is that the coefficient of friction regularly and continuously declines as the speed increases. The observed coefficient of friction between a cast iron brake shoe and a chilled wheel at 55 miles per hour is 0.111; from the data acquired it is found that this coefficient becomes 0.105 at 60 miles per hour, 0.085 at 85 miles per hour and 0.072 at 100 miles per hour. This means that at a speed of 100 miles per hour the frictional resistance of a bearing should be less with no lubricant at all than is the case at ordinary speeds, even when the best lubricants are employed.

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HARDWARE

OF the potent influences at work for curtailing the trade of the retail mail order houses the interurban electric road is perhaps most feared by those powerful corporations. It is an ally that has silently arrayed itself in the camp of the Hardware merchant, and its development and extension are invariably followed by decreased catalogue sales from every community reached. The rural dweller enjoying its service is no longer dependent upon uncertain country pikes and the indifferent service of the steam roads for opportunities to visit his neighboring village, and his purchases are made in the emporium of the latter, where the goods are displayed, to the preference of the not always infallible pictures shown in the mail order volume. Merchants in county seats and important towns have felt the effects of this beneficient influence in greater measure than those in smaller communities, but the trade of all has been materially increased and fewer mail order purchases have been made. The express service of the electric road also enables the retailer to be in closer touch with his jobber, permitting him to carry a more varied stock in smaller quantities than is otherwise necessary, while the lower transportation charges permit him to sell at a lower price and on a basis that challenges mail order competition. Prompt shipments can also be made of purchases, and the low freight charge on bulky goods is a serious barrier to the mail order house dependent upon high railroad tariffs and long hauls for deliveries to different points.

One of the most frequent of the many inquiries which come to us in regard to practical or theoretical problems of the trade is from hardware merchants who desire to have recognition as jobbers and who ask what steps should be taken that they may be given a place on the jobbers' list. The question is, however, asked under a misapprehension—the fact being that there is no jobbers' list, in the sense in which this expression is used. There is in the trade no formal list of those who obtain jobbers' prices nor is there any standard authority by which the trade is divided into jobbers and retailers. Such a division would indeed be impracticable, in view of the diverse conditions under which business is transacted. There are many houses which are universally recognized as jobbers doing an exclusively wholesale business, and there are, on the other hand, a multitude of houses which are retailers and nothing more. Between these two classes, whose grading would occasion no difficulty, there are, however, many houses occupying a middle ground and doing both a wholesale and a retail trade. Houses of this character are far more in number than those doing only a wholesale business—probably 10 to 1. Some of them have recognition from manufacturers as jobbers, while others are in most cases treated as retailers. There is, however, no formal line of demarkation between them. There is no jobbers' list which settles the question as to their standing in the trade. Some of these houses probably pay retailers' prices on certain classes of goods, while others are able to buy at jobbers' prices, perhaps as advantageously as some of the much larger concerns. Those indeed who are generally ranked as jobbers do not find that this fact entitles them to the lowest prices from all manufacturers. There are some retail houses, on the other hand, which handle large quantities of certain kinds of goods or are for some reason deemed desirable customers and buy at exceedingly close figures. This is a matter of negotiation and agreement between the buyer and the seller. There is no royal road to close buying. Each merchant must look out for himself. If he gives a proper attention to the matter—and it certainly deserves his best thought and continuous effort—he will succeed in getting from manufacturers as low prices as the character and extent of his business will justify.

Condition of Trade.

There having been no recent changes in the market for raw material or in the character or volume of the demand, the Hardware market as a rule remains in substantially the same condition as for the past month or two. Manufacturers are, with scarcely an exception, fully occupied on orders, many of them, indeed, being occasioned some embarrassment on account of slow delivery of materials or by difficulty in obtaining the labor they require. They are thus unable to make shipments as promptly as the convenience of their customers would suggest. Jobbers are finding this a very active season, and are kept busy executing orders which come in to them from their traveling force or from their mail order departments, which are with many of them of growing importance. The shortage of goods has occasioned more or less trouble, and many retail merchants are paying the penalty of having deferred their purchases too long. Jobbers' stocks in general are, however, ample, having been ordered early and on liberal lines. Prices in general show little change. The tone of the market is steady and firm, as a result in large measure of the great volume of current business, the confidence which prevails in the trade and the ample prosperity which exists throughout the country.

Chicago.

The heavy movement of Window Screens and Doors and Poultry Netting from jobbers' stocks referred to in these columns last week has been intensified in the past few days, and the heavy consumptive demand for which the retailers failed to prepare has diverted the bulk of the buying in these lines from the usual channels to the leading distributers. On Wire Cloth the reverse obtains, as the low prices offered to the trade last fall were an incentive that led to the placing of contracts much larger than in former years. The San Francisco disaster has already increased the demand for certain lines, such as Corrugated Galvanized Sheets and Wire Nails, to be used in the erection of temporary structures. Local stocks of Corrugated Sheets, 26 and 27 gauge, have already been depleted, and none of the manufacturers is in position to make shipments in less than 30 to 60 days. Large stocks of Nails in San Francisco warehouses which were unharmed by fire were badly mixed by the earthquake, and heavy shipments are now going forward to meet the heavy demand. The strengthening of the finished iron market has resulted in a stronger tone on Nuts, Bolts and kindred lines, and while no advances are anticipated concessions have been withdrawn. Iron Bars from store in small lots are now firmly held at 2 cents, and at a meeting of the manufacturers held here last week the prevailing quotation of 1.66½ cents on car lots was reaffirmed. Local merchants have secured an injunction preventing the immediate enforcement of the wide tire ordinance. An early decision is expected, and if it is found defective an effort will be made to secure the passage of another measure that will conform to the local requirements. Retailers are now placing large orders with distributers for harvesting tools, and seasonable goods are moving freely, both manufacturers and jobbers being unable to cope

with the demand. Collections continue exceptionally good considering the season, and while there has been a slight falling off in the volume of business totals have been in excess of last year's records.

Cleveland.

THE W. BINGHAM COMPANY.—The spirit, courage and self sacrifice which has been exhibited by the citizens of San Francisco and vicinity makes all Americans proud. Never in the history of this country was such havoc and devastation wrought in so short a time, and the courage and fortitude displayed by our people in this scourged city is marvelous.

Glad are we to learn that the real loss of life was not so large as at first reported. Of course the real suffering, hardship and privation follow such destruction as that which was wrought. The great outpouring of sympathy in the form of money, supplies and help of every kind to the stricken people is truly noble. It shows how closely Americans are knit together in sympathy and how ready they are to extend a helping hand to each other in time of trouble and distress. Of course to rebuild and restock San Francisco and other cities in California will require an immense amount of material and manufactured goods for the next four or five years.

It is reported that orders have been issued by some of the large steel manufacturers to give preference at once to orders for structural and other steel material for rebuilding Government and business blocks and private dwellings in California. Now what effect will this have on the general supply of manufactured goods throughout the country? Won't it make a scarcity, and would it not be well for dealers to keep their stocks as well assorted as possible, that they may take care of their nearby and home trade?

We all know how far behind the manufacturers are on many lines of goods at the present time, and this new, large and imperative demand will naturally increase prices on many goods and result in scarcity in nearly every line. It is reasonable to suppose that manufactured goods of all kinds—viz., steel and cast iron, manufactured Hardware, drugs, dry goods, groceries and clothing—in fact, all kinds of business throughout our broad land, will be largely stimulated, for we must remember that millions upon millions of dollars' worth of all kinds of goods were utterly destroyed, gone up in smoke and effaced from the earth.

Cleveland trade in mining, milling, manufacturers' and general Hardware supplies and House Furnishing Goods is very large. Never at this time of the year were the orders so large or so abundant. The five Cleveland Hardware jobbers seem to be able to take care of their trade in good shape, and are not only able to fill their orders quite complete, but Cleveland being such a splendid distributing point, both by rail and now by water (as navigation has opened up) the spring and summer trade of 1906 is going to be immense.

There is no disposition on the part of the jobbers to take advantage of the times and demand for goods to increase prices; they are satisfied to hold prices on an even and reasonable basis, content to make their profits predicated on the volume of business coming to them.

The reported earnings of the United States Steel Corporation for the first quarter of this year are somewhat of a barometer of the amount of business we may expect for the remainder of the year. We all know that if the steel business is flourishing and prosperous all other lines of business are favorably affected. Therefore we can only say to our friends, don't be afraid to buy goods in liberal quantities from the jobbers who are able to supply you promptly and at reasonable figures. Get your goods and be ready to pass them over your counter and take your profit.

NOTES ON PRICES.

Wire Nails.—A comparatively small amount of new business is being received at the mills, but shipments on contract orders are heavy. The market is firm and generally well sustained, with the exception of some competitive points in the South. Prices are firm and quotations are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in ten days:

Carloads to jobbers	$1.85
Carload lots to retail merchants	1.90

New York.—Demand for small lots from store is steady, but less than during March or April. There is an absence of any spring rush. It is reported that jobbers' prices are being well maintained. Small lots from store are quoted on the basis of $2.15 per keg.

Chicago.—Shipments of Wire Nails to San Francisco already aggregate 50,000 kegs, and additional shipments are already being figured upon. The mills, however, have not been called upon to make shipments of other Wire products, Western stocks being sufficiently large to meet immediate requirements. Very little new tonnage is being placed by large jobbers and distributers, although specifications are heavy and are in excess of those received by the mills at this season last year. Stocks without exception are light. Quotations are firmly maintained, as follows: $2 in car lots to jobbers and $2.05 in car lots to retailers, with an advance of 5 cents for less than car lots from mills.

Pittsburgh.—A fair amount of new business is being placed in Wire Nails, which with the heavy season contracts taken by the mills some time ago, insures steady operations up to July 1 or longer. The mills still complain of a shortage in Steel, which is curtailing output to some extent. Prices continue firm, but for Southern points of delivery slight concessions are made by lower Ohio River mills that have low rates of freight to these points. This, however, is without effect on the general market, which is well sustained. We quote: Wire Nails, $1.85 in carloads to the large jobbing trade and $1.90 in carloads to retail merchants, f.o.b. Pittsburgh, plus actual freight to point of delivery, terms 60 days, less 2 per cent. off for cash in ten days.

Cut Nails.—Our Pittsburgh advices reflect a slight irregularity, as the result of which some of the mills outside the Eastern Cut Nail Association are reported to have made concessions in price of 5 to 10 cents per keg in Eastern territory, according to buyer and desirability of order, on car load lots of Cut Nails. It is, however, understood that these irregular prices have been withdrawn. Quotations are as follows: $1.80, base, for carload lots, fo.b. Pittsburgh; $1.85 for less than carloads, f.o.b Pittsburgh; $1.95 for carload lots, on dock, New York; $2 for less than carloads, on dock, New York. Iron Cut Nails at points west of Buffalo and Pittsburgh are held at 5 to 10 cents advance on Steel Cut Nails.

New York.—The local demand for small lots from store is fairly good. It is reported that slight concessions are occasionally made to induce trade. Quotations are on the basis of $2.05 per keg.

Chicago.—Demand continues steady and prices are firm. Quotations are as follows: Steel Cut Nails in car lots, $1.95; less than car lots, $2; Iron Cut Nails, $2.05 in car lots; less than car lots, $2.10.

Pittsburgh.—In spite of the scarcity and high prices of Steel, there is some unevenness in prices of Cut Nails, which are shaded about 5 cents a keg, and we understand that in exceptional cases $1.70 at mill has been done. We quote Cut Nails at $1.75 to $1.80, base, f.o.b. Pittsburgh, for carload lots, and $1.85 in less than carload lots. For Iron Cut Nails an advance of 10 cents per keg is charged.

Barb Wire.—Railroad requirements furnish the bulk of the new business to mills, as Hardware demand is about over. Specifications on contracts are being received quite freely. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in ten days:

	Painted.	Galv.
Jobbers, carload lots	$2.00	$2.30
Retailers, carload lots	2.05	2.35
Retailers, less than carload lots	2.15	2.45

Chicago.—Current demand is limited almost entirely to railroad requirements, as the season for the Hardware trade is practically at an end. A few filling in orders continue to be received from time to time, but are limited

almost entirely to small lots. Quotations are firmly maintained, as follows: To jobbers, Chicago, car lots, Painted, $2.15; Galvanized, $2.45. To retailers, car lots, Painted, $2.20; Galvanized, $2.50. Retailers, less than car lots, Painted, $2.30; Galvanized, $2.60. Staples, Bright, in car lots to jobbers, $2.10; Galvanized, $2.40; car lots to retailers, 10 cents extra, with an additional 5 cents for less than car lots.

Pittsburgh.—Orders coming in from the Hardware trade are few and small, but a fair amount of tonnage is being placed with the mills for railroad purposes. Specifications on contracts are coming in quite freely. Prices are firmly maintained, as follows: Painted Barb Wire, $2, and Galvanized, $2.30, in carload lots to the large jobbing trade, with the usual advance of $1 a ton to retailers in carload lots, f.o.b. Pittsburgh, 60 days, or 2 per cent. off for cash in ten days.

Smooth Fence Wire.—Some placing of contracts for forward delivery is noted, while current orders from telephone companies are coming to the mills in large volume. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in ten days:

Jobbers, carloads	$1.70
Retailers, carloads	1.75

The foregoing prices are for base numbers, 6 to 9. The other numbers of Plain and Galvanized Wire take the usual advances, as follows:

	6 to 9	10	11	12&12½	13	14	15	16
Annealed	Base	$0.05	.10	.15	.25	.35	.45	.55
Galvanized	$0.30	.35	.40	.45	.55	.65	1.05	1.15

Chicago.—Manufacturing interests are now beginning to place contracts for the last half of the year for Wire to be used in the manufacture of Springs, &c. This demand has set in much earlier than in former years, it having been the custom to renew these contracts during the months of July and August. Requirements for Fence manufacturers are very small as the season is practically at an end. Quotations are firm and unchanged, as follows: To jobbers, $1.85, f.o.b. Chicago, in car lots, and car lots to retailers, $1.90.

Pittsburgh.—The Fence season has about closed and specifications from Fencing manufacturers have fallen off very largely. A heavy tonnage is coming in from telephone companies and the mills are very comfortably filled with orders, which will take to July 1 or longer to execute. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in ten days:

Jobbers, carloads	$1.70
Retailers, carloads	1.75

The above prices are for base numbers, 6 to 9.

Binder Twine.—According to reports buying is not active, as merchants who have not purchased apparently are not inclined to do so. The Sisal Hemp market is not considered a strong one, and has affected the prices of Sisal and Standard Twine. It is understood that 9¼ cents per pound is a price that has recently been named in some instances for Sisal and Standard in the West. It is a question whether this price will become at all general. With a strong market for Manila Hemp Manila grades of Twine do not appear to have been affected.

Shot.—Under date of May 8, the following advanced prices for Shot are announced; terms, 30 days, or 2 per cent. discount for cash in 10 days:

	25 lb. bag
Drop Shot, sizes smaller than B	$1.85
Drop Shot, B and larger sizes	2.10
Buck and Chilled Shot	2.10
Dust Shot	2.30

The usual extra discount is made to purchasers of ten tons or upwards.

Rope.—There is a fair amount of new business and manufacturers are looking forward to an increase in demand. Quotations remain unchanged, as follows: Pure Manila, 12½ cents; B quality, 11½ cents; Pure Sisal, 9½ cents; No. 2 quality, 8 cents per pound.

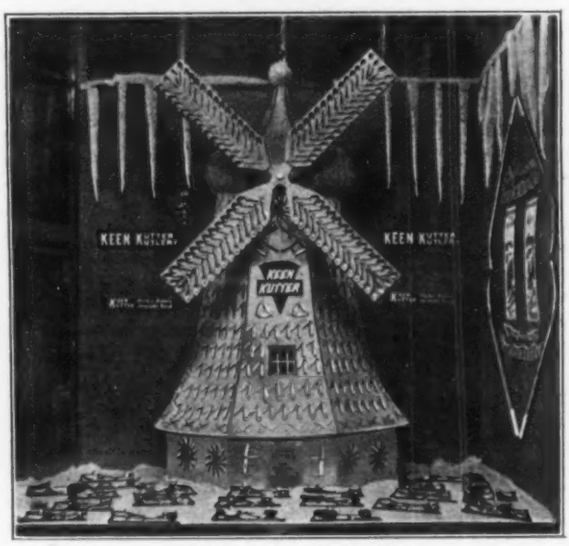
Window Glass.—Owing, it is reported, to a misunderstanding in regard to the date of the glass manufacturers' meeting, which was scheduled for last week, a full representation of manufacturers was not present, and no action regarding prices was taken. Reports were received, however, which indicated that the total stocks in jobbers' and manufacturers' hands amounted to from 2,000,000 to 2,250,000 boxes of Glass, 1,400,000 boxes of which were held by jobbers. The decrease in production, which is usually in evidence at this season, has commenced, caused by shortage of men in factories and the inability to produce as large an amount of glass in warm weather as during the cooler months. There are reports among the trade that prices of glass will be advanced 25 per cent., but there is no evidence of this at present. Probably some sizes of glass will be hard to get, and these sizes may command higher prices. New York jobbers' quotations are unchanged, as follows: 90 and 10 per cent. discount for all sizes of single and double strength.

Linseed Oil.—There is some demand for small lots of Oil, but not as large as had been anticipated. Shipments on contract orders from crushers are large, and some who have been obliged to accept deliveries are offering Oil at figures lower than crushers' quotations. The majority of large buyers are said to have their requirements covered for some time to come, in many instances to July 1. Quotations are as follows: City Raw, 42 to 43 cents per gallon; out of town Raw, 39 to 40 cents per gallon. Boiled Oil is 1 to 2 cents per gallon advance over Raw.

Spirits Turpentine.—Receipts at Savannah have been comparatively light, while exporters have placed large orders for May to August deliveries, which have absorbed available Spirits for the time being. The local market is quiet, with a limited amount of offerings. Arrivals are expected, however, in the immediate future. New York quotations are unchanged, as follows, according to quantity: Oil Barrels, 67 to 67½ cents; Machine Made Barrels, 67½ to 68 cents per gallon.

CUTLERY WINDOW DISPLAY.

THE accompanying illustration is from a photograph illustrating methods of Murphy-Maclay Hardware Company, Great Falls, Mont. It represents an effective window display of Keen Kutter Cutlery, and was intended, we are told, to emphasize the extensive variety of the line, every item shown differing either in style, size or weight. Black cloth was used as a background on the back and side of the window and red cloth on the inclined bottom. The large trademark at the back was outlined with bright Coil Chain lined with yellow tape. Murphy-Maclay Hardware Company refers to window displays as being profitable in attracting business, and states that this striking exhibit was no exception to the rule.



Cutlery Window of Murphy-Maclay Hardware Company.

The Post Check Currency Campaign.

FROM OUR SPECIAL WASHINGTON CORRESPONDENT.

WASHINGTON, D. C., May 8, 1906.

THE House Post Office Committee at a hearing granted to the promoters of the post check currency scheme has torn the mask from this project and revealed it as a device for which "sentiment" has been laboriously worked up by a bureau managed by ex-post office officials and receiving the hearty co-operation of prominent catalogue houses. The literary bureau referred to, it was practically confessed before the committee, has prepared large quantities of matter which has been published in various newspapers and magazines as current news matter when, in fact, its preparation was paid for by the author of the post check project. It was also admitted that the inventor of this scheme has held conferences with regard to it which have been attended by representatives of prominent mail order houses, and that Sears, Roebuck & Co. have furnished data upon which arguments in behalf of the measure have been based. Not the least important of the admissions made before the committee was the statement that ex-Auditor Henry W. Castle, whose indorsement of the post check currency plan has been widely advertised as that of a prominent, unbiased postal expert, has been almost continually in the employ of the post check bureau for several years past.

The Disclosures Before the House Committee

have greatly reduced the chances of a favorable report on this catalogue house device, and members have also been much impressed by the telegrams and letters received from Hardware retailers and merchants in other lines, but several members of the committee are still disposed to favor this scheme and the plan for the consolidation of third and fourth class mail matter, whereby the postage rate on merchandise would be reduced from 16 to 8 cents per pound. The members of the trade should therefore lose no time in taking up the matter with their Senators and Representatives, and also with the members of the post office committees of both houses. The postal appropriation bill is still before the Senate committee, where progress has been slow during the past week, but it is expected that the measure will be completed before the end of the current week. The department officials are exerting every effort to force the consolidation plan into the bill as a "rider," and merchants in writing to their Senators should remember that this amendment will be open to the "point of order" that new legislation can be added to an appropriation bill only by unanimous consent. Senators should be requested to make the point of order against the consolidation scheme that it may be forced off the bill. Under the rules of the Senate a single objection will defeat this particular catalogue house project.

The Official Record of the Hearing

before the House Post Office Committee on the post check project is destined to form an important chapter in the history of the catalogue house campaign. Those who addressed the committee included C. W. Post, a manufacturer of cereal foods of Battle Creek, Mich.; Clarence Dawson, the secretary of Mr. Post's literary bureau in this city, and Representative Gardner of Michigan, who introduced the post check bill at its author's request. Mr. Gardner was the first speaker. He described the bill in some detail and then frankly stated that he was not its author, but that it was "the product of Mr. Post's prolific brain, born in large part, as I understand it, out of his wide experience in monetary matters and dealing with large numbers of people." In reply to a question as to whether it would not be necessary to provide fractional currency in addition to the $1, $2 and $5 post check notes, which alone are authorized by the post bill, Mr. Gardner said that after considerable discussion "it was the consensus of opinion that it would be better to go thus far at this time, and if later it was thought advisable to incorporate a fractional currency provision it could be done." It thus appears at the outset that the friends of the post check bill regard it merely as a makeshift. Mr. Gardner also said that

One Inducement

for this proposed legislation was the establishment and extension of the rural free delivery, whereupon Representative Stafford of Wisconsin said:

I invite your attention to the rules of the Department which permit any patron of the rural free delivery to request the postal carrier for any money order of any amount that the patron desires, which will be furnished by the carrier on the next trip; or, if the patron desires, will be mailed in the letter without return. Wherein does not that added advantage that patrons now have by reason of the extension of the rural delivery obviate to a certain extent the call for a post check currency as embodied in this bill?

Mr. Gardner replied:

It does obviate to a certain extent the necessity for this, but from my point of view that provision which allows a rural delivery carrier access to private mail, as he would have if he can inclose the money order at the post office for the patrons, is not a good provision; it puts a temptation on a great many men that they might not be able to bear. If there is anything sacred it is private mail, so far as the Government is concerned.

Mr. Stafford retorted that the temptation referred to could easily be removed if the patron would have the money order returned to him to be inclosed in his letter.

Other Criticisms.

Representative Finley of South Carolina made a strong point against the bill that it proposed to withdraw from circulation all $1, $2 and $5 bills except bank notes, using post checks in their stead, and that the inevitable result would be a contraction of the currency equal to the amount of such notes as might at any time be in course of transit through the mails or in the possession of the banks awaiting cancellation.

Representative Sperry of Connecticut raised the question as to whether the project possessed any advantages over the present money order system, to which Mr. Gardner replied that under the post check scheme every man would carry his money order system in his pocket. Mr. Darragh of Michigan asked if it were not a fact that the great majority of transactions are not in sums of even dollars, and Mr. Gardner was obliged to concede that the post check system would provide for only a limited portion of current transactions, adding: "The Treasury authorities seem to shrink from adopting the fractional currency system, at the outset at least."

Mr. Post Before the Committee.

Mr. Post, author of the scheme, then addressed the committee. In reply to a question as to how he came to devise his invention, he said:

A number of years ago, as executive of the Postum Company, at Battle Creek, I noticed we had great difficulty in getting small sums paid through the mails. When I wanted a little money to send through the mails I had difficulty in sending it conveniently.

Representative Darragh asked whether the expense of printing and reissuing the proposed checks would not be greater than the present cost of money orders, whereupon Mr. Post replied that "the Auditor of the Post Office—the ex-Auditor, Mr. Castle—made an exhaustive research and made his report of the comparative cost of the present money order system and this system, and I will say to you that the saving to the Government is very considerable by this system." Following this statement Mr. Post was subjected to cross-examination with regard to Mr. Castle, as follows:

Mr. Snapp: Is ex-Auditor Castle now in your employ in this matter?

Mr. Post: He has been in my employ.

Mr. Snapp: Since he left the Department?

Mr. Post: Yes; not continuously, but to take up such matters as this—make such compilations as we needed. I recompensed him for doing it. I employed him because he was thoroughly posted in the internal matters of the Post Office Department, particularly the auditing branch. I called him in as an expert and paid him for his time.

Mr. Lloyd: And your connection with it, then, is a pure benefaction?

Mr. Post: Yes.

Mr. Lloyd: And you have no money interest in it? Whatever money you expend comes out of your own pocket?

Mr. Post: Yes, sir.

Mail Order Houses Interested.

Representative Snapp then called Mr. Post's attention to a statement made by him several years ago at a former

hearing before the committee to the effect that the benefits of the proposed system would go largely to the mail order houses. Mr. Post said that he did not remember the statement.

Subsequently Mr. Post remembered something more to the point with regard to Sears, Roebuck & Co. and other mail order concerns, as reported below.

At this juncture Representative Stafford asked Mr. Post to state the reasons why the post check plan would have an advantage over the present money order system or the plan of sending silver certificates through the mail. In reply Mr. Post made a statement that will cause the average retail merchant to smile broadly, either at Mr. Post's lack of knowledge concerning retail merchandising as conducted to-day or at his awkward attempt to put the committee off the track. The colloquy with Mr. Stafford is given verbatim:

Mr. Post: A farmer will no more send a bill through the mail than a business man will buy a money order. You can enact all the laws you want to, but you can't make the farmer send money like that through the mail with no safeguards around it.

Mr. Stafford: Do I understand that the farmers do not to-day send money through the mails to the large mailing houses?

Mr. Post: Mighty seldom.

Mr. Stafford: From my information, derived from the letter carriers, I understand that a great amount of currency is sent to the department stores.

Mr. Post: Then, if that is done, it is because the senders do not like the money order, is it not?

Mr. Stafford: Not necessarily.

Mr. Post: You cannot get a farmer to risk a dollar once in a million times, where a business man would risk it and say to himself, "If I lose it it is all right."

Mr. Stafford: The farmer has the option of either taking the risk or paying the 3 cents additional for a money order and having it secure.

Mr. Post: By going to that trouble?

Mr. Stafford: The only trouble is waiting for the rural carrier to come along, and then the farmer says to him, "Here, Mr. Rural Carrier, I want a money order for this, payable to so and so; here is my order and here is the fee and here is the letter; please put the money order in there;" and that's all the trouble he has in connection with that.

Mr. Post: People demanding ten deliveries of mail a day are not going to wait two days or more to transact their business.

Mr. Stafford: The rural patrons are not receiving eight or ten deliveries a day.

Mr. Post: I am talking about the people as a whole; you cannot put upon the people of this country that kind of delay.

Mr. Stafford: You suggested the rural patron, and he only receives one delivery a day; but he is not obliged to even wait a day for the transmission of the money order; he can have it attended to by the rural carrier and sent off that very day, if he wishes to.

Some Estimates from Chicago.

Mr. Gardner of New Jersey made the point that the post check currency scheme would increase rather than decrease the loss on the present money order system and succeeded in developing the fact that in calculating that the post check currency scheme would not cause a deficit its projectors figure that it would increase the amount of first-class mail, and credit the device with the postage as well as the fees for the checks. Mr. Post also said: "As near as I can get at it 19 out of 20 of these letters do not contain money orders, 1 out of 20 does; that proportion will vary with different houses, some receiving more money orders, some less." The following colloquy then ensued:

Mr. Lloyd: Where do you get that estimate?

Mr. Post: We get it particularly from Chicago merchants.

Mr. Lloyd: From Sears, Roebuck & Co., and Montgomery Ward & Co.?

Mr. Post: Sears, Roebuck & Co. were represented in the meeting; the meeting was composed practically of publishers.

Mr. Darragh: Did they claim that the bulk of these remittances in mail was in currency or by check?

Mr. Post: It varies. People who are willing to risk it put in a dollar. I think most any man here if he wanted to send $5 to New York would put in a $5-bill in a letter unless he drew a check; he would certainly not buy a money order.

Mr. Murdock: What limit do business men place on the amount you can pay in stamps, as a rule?

Mr. Post: You cannot limit it. Boyce & Co. and some other firms get over $1000 in one day sometimes in stamps. It is ridiculous to think the people of a great nation have to transact their business in stamps.

Mr. Gardner of Michigan: Will you state what single houses receive such amounts in stamps?

Mr. Post: I know Boyce & Co. of Chicago receive as much as $1000 some days in stamps.

Mr. Stafford: Will they not still receive those stamps even if your scheme is adopted?

Mr. Post: Yes, I think there is no doubt about that.

The members of the committee were evidently much interested in the disclosures of the fact of Sears, Roebuck & Co.'s lively concern in the pending project. Subsequently Mr. Snapp undertook to find out something more about the bureau maintained for the purpose of working up public sentiment in favor of the post check scheme, which resulted in some very frank admissions by Mr. Post, as follows:

Mr. Post Pays All the Bills.

Mr. Snapp: Mr. Post, soon after Mr. Castle left the employ of the Government I received a letter from him saying, I think, that he had gone into some organization for the purpose of pushing this post check bill. Can you tell me the name of that organization?

Mr. Post: It goes by the name of the Post Check Bureau. I pay all the bills. I come pretty near being the Post Check Bureau.

Mr. Snapp: Is there any one else connected with it?

Mr. Post: None, except those in my employ. Mr. Dawson is secretary, and there are certain stenographers and typewriters.

Mr. Snapp: Has any one else contributed toward the expense of maintaining that bureau?

Mr. Post: Not one dollar, Mr. Snapp. I have had checks sent in—contributed—$100, $150 and less sums, and they have always been returned.

Mr. Snapp: Then no one has taken any interest in this matter, so far as the committee knows now, except you personally, through your organization?

Mr. Post: That is rather a broad statement.

Mr. Snapp: Is that so?

Mr. Post: No, it is not so.

"Working" Up "Sentiment."

Mr. Snapp: Mr. Post, I have seen in publications long articles on this matter, urging the passage of such a bill. I have assumed that it was paid matter. Has that kind of work been done by you?

Mr. Post: I do not recall a penny having been paid to print our matter in the papers.

Mr. Snapp: Then if such matter was paid for it has been done by somebody else?

Mr. Post: Without my knowledge.

Mr. Steenerson: Has not this matter been printed free?

Mr. Post: We have furnished matter the same as the news agencies furnish matter.

Mr. Snapp: I understood you had not.

Mr. Post: We do not pay anybody to print it, but have done just as you would in the promotion of any campaign. You will find, Mr. Snapp, if you care to look it over, here is quite a list of publishing houses, and all sorts of commercial houses, and farmers' institutes, and boards of trade, and all sorts of organizations indorsing this currency, and I know of no one that is opposed to it except the express companies.

Mr. Snapp: You know, Mr. Post, I have never heard any expression from an express company in opposition to this, but I have had hundreds of petitions and letters against it.

Mr. Post: Is it possible? From what class?

Mr. Snapp: From retail merchants and others of that class.

Mr. Lloyd: Is it not the retail merchants who are concerned to avoid the parcels post proposition?

Mr. Snapp: And this also?

Mr. Post: Some of the retail merchants, I know, have passed resolutions rather denouncing me for having anything to do with this matter, saying that I am dependent upon them for my support—which is true—and I am unworthy because I advocate a measure that is contrary to their interests—although to the interests of the people in general.

The public will now readily understand exactly the methods employed in booming the Post check project, and fortunately for the retail merchants of the country the Post Office committees of both houses—for practically the same information was developed before the Senate committee as was given to Chairman Overstreet and his colleagues—also understand them. It has been made perfectly obvious that this scheme is merely the fad of a single man who has become an ardent enthusiast with regard to a pet project and who is willing to spend large sums of money annually in building up an artificial sentiment in its favor. As to the ethics of the methods employed there is no occasion for discussion here, although that feature of the case will no doubt be very carefully considered by the Congressional committees.

W. L. C.

HENRY DISSTON & SONS, Philadelphia, are distributing among the trade a handsome and substantial new advertising hanger. It is made of stamped metal, 13 inches high by 9¼ inches wide, with a broad bevel edge which resembles a frame and serves to throw out the text and familiar design, "The Saw That Made Henry Disston Famous with the Carpenters." The No. 7 Hand Saw is reproduced in actual colors and the firm's well known scale trademark is also featured.

ASSOCIATION FORMED IN OREGON.

AT a meeting held in Portland, Ore., on the 10th ult., the Hardware and Agricultural Implement merchants of the State completed an organization under the style of the Oregon State Retail Hardware and Implement Dealers' Association. The following officers were chosen for the first year: John H. Simpson, Corvallis,

JOHN H. SIMPSON,
President.

H. J. ALTNOW,
Vice-President.

president; H. J. Altnow, Woodburn, vice-president; Henry J. Goff, Forest Grove, secretary, and Frank Dayton, Portland, treasurer. The Executive Committee comprises these officers and E. F. Willis, Banks; F. E. Chambers, Eugene, and Frank Spencer, Salem. The membership fee has been fixed at $2, and the annual dues at $6. The annual meeting of the association will be held on the second Wednesday of February. The president has been

FRANK DAYTON,
Treasurer.

H. J. GOFF,
Secretary.

empowered to appoint for each county of the State one member, whose duty shall be to induce merchants to join the association and to encourage the formation of local associations.

Several years ago an effort was made to start an association in this State, but it failed to enlist the interest and support of any considerable number of the merchants and was in time abandoned. Latterly, however, business men from the East have been settling in Oregon, bringing with them the association idea as successfully carried out in the States where they were formerly located. These are relied upon to put the movement on a good working basis, when it is hoped to interest the other merchants who are somewhat backward in taking hold, thus developing a strong and influential association.

THE AMERICAN SCREW COMPANY, Chicago, states that fire seriously damaged its stock of goods at 19 Lake street, which will somewhat delay the filling of orders, although direct shipments from the factory can be had without much loss of time. Temporary quarters have been secured for the receipt of stock now on the road, and will be used while the old store is being refitted.

THE HOT SPRINGS CONVENTIONS.

WE understand that advance reservations of hotel accommodations at Virginia Hot Springs during the simultaneous conventions of the Southern Hardware Jobbers' Association and American Hardware Manufacturers' Association, June 12-15, are unusually heavy, and it looks as though the attendance would exceed that of any former gathering of the members of these associations. All applications for rooms should be made direct to the hotels, the New Homestead and the Alphin, the former being the official headquarters.

A special train will be run from New York to the Springs, under the direction of the Chesapeake & Ohio Railroad, leaving the metropolis on Monday, June 11, a few minutes after or before the regular train, which leaves at 4.55 p. m. and arriving at Hot Springs as 8.30 a. m. Tuesday. Applications for accommodation on this train should be addressed to U. L. Truitt, general eastern passenger agent of the C. & O. R. R., 362 Broadway, New York. The Southeastern Passenger Association, covering territory east of the Mississippi and south of the Ohio and Potomac Rivers, has granted a one-fare round trip rate, on the certificate plan. Other passenger associations have granted a one and a third fare round trip rate, on the certificate plan. Wednesday evening, June 13, has been selected as the time of the banquet, in which the members of both associations and other visitors will participate. It is planned to combine the programmes of both meetings in one booklet, on the covers of which two borders will be used, to distinguish the two associations and their proceedings. F. D. Mitchell, 309 Broadway, New York, is secretary of the Manufacturers' Association, and C. B. Carter, Knoxville, Tenn., secretary of the Jobbers' Association.

An identification badge will be furnished to such members of both associations as shall signify their intention of attending the conventions. These badges will display on celluloid in plain type the name of the individual and the name and address of the company represented, and will indicate by the color of a small ribbon attached whether the wearer is a manufacturer, jobber or some guest of either association. They are designed to be clearly readable at a distance of four feet. The use of this badge will do away with all other badges and numbered buttons with printed keys, and it has been decided to discontinue printing the booklets giving the names of those in attendance at the convention. It is requested by Mr. Mitchell, secretary of the Manufacturers' Association, that names of those expecting to go to Hot Springs and desiring badges be sent to his office not later than June 2, and if possible prior to May 26.

A FEW DAYS after the San Francisco disaster the Lalance & Grosjean Mfg. Company, realizing the necessity there for standard and staple articles of household ware at once, loaded a car with enameled cooking, kitchen and sanitary utensils at its factory in Woodhaven, L. I., and consigned it, with the company's compliments, to Mayor Schmitz of San Francisco, with a brief note inclosing a memorandum invoice and bill of lading, together with a note of sympathy for the stricken people of that city. It may also interest the friends of this company to know that its president, A. J. Cordier, paid a visit to the New York office for the first time in six months on April 19, after an illness extending from October 18 last. Mr. Cordier will not confine himself closely to business but will keep in touch with it until fully restored.

ROEBUCK WEATHER STRIP & WIRE SCREEN COMPANY has moved from the quarters long ocupied by it in New York, at 172 Fulton street, to 176 Fulton street, where it now has the street floor and basements, the latter for carrying stocks of the various commodities made at the Brooklyn factory. In addition to screens of all kinds for windows and doors there is produced at this plant Weather Strips, Spring Door Bottoms, Window Ventilators, Mosquito Canopies, Head Nets, &c.

JAMES H. RITTER.

MANY manufacturers and Hardware merchants will learn with regret of the withdrawal of James H. Ritter from the Hardware trade and his entrance on the activities of another field. In order to assume September 1 the presidency of the Chelton Trust Company of Germantown, Philadelphia, he has resigned from the firm of the Biddle Hardware Company of Philadelphia, with which he has been identified for more than thirty years, his business career beginning with the employment he obtained as a boy with that company in January, 1876. The Chelton Trust Company is a new organization, starting with a capital of $200,000 and a surplus of $100,000, and the outlook for its business is regarded as very bright. The fact that the invitation to the presidency of this company came to Mr. Ritter without any solicitation or even intimation on his part is a striking evidence of the confidence in which he is held. Before taking up the duties of his new position Mr. Ritter will have an opportunity to enjoy a holiday during the summer, which will be very acceptable after the arduous duties of the position which he has held and the strain of his 30 years' work. In view of Mr. Ritter's personal qualities, his high character, culture and ability, the Hardware trade suffers a real loss in his withdrawal from it, and in his new departure he will bear with him the best wishes of a multitude of friends.

DEATH OF ALAN COLE.

ALAN COLE, senior member of the firm of Wm. H. Cole & Sons, Baltimore, Md., died very suddenly of apoplexy April 25. He had not been ill previous to the attack and was attending to business the day before it occurred. Mr. Cole was widely and favorably known to the trade. He had a remarkably retentive memory and a high order of intellectuality. He was greatly esteemed by his associates, especially the traveling men of the house, who looked upon him as a brother, owing to his kindly, charitable disposition. He was always ready to help those in trouble, and his death will be sincerely mourned by a host of friends and acquaintances. He was a member of many social and business organizations. He leaves a widow, two brothers and two sisters. Lloyd Cole, the surviving member of the firm, will continue the business under the name of Wm. H. Cole & Sons, now located at 40, 42 and 44 South Charles street.

REQUEST FOR CATALOGUES.

THE representative of Francisco Bolonha, who has recently established a new house in Para, Brazil, for the importation of all kinds of light and heavy Hardware and machinery, is desirous of receiving manufacturers' catalogues, with price-lists and discounts for export, in time to take them back with him, about June 15. To be of any value discounts or net prices should be given. Communications of this character can be sent to G. L. Lewis, care of *The Iron Age*. Both Francisco Bolonha and his representative, a native American, were educated as engineers in the United States.

TRADE ITEMS.

THE MORTON-SIMMONS HARDWARE COMPANY, Wichita, Kan., will erect a 40-foot clock tower on its big wholesale house on North Mosley avenue. The clock will have four faces, each 6 feet in diameter, and each will bear the motto and trademark of the Simmons Hardware Company: "The recollection of quality remains long after the price is forgotten."

THE BRYDEN HORSE SHOE COMPANY, Catasauqua, Pa., is considering seriously the removal of its plant to another location. The reason for this is the proximity of its Catasauqua plant to the residential part of the town and the hostility which has developed on account of its smoke. The company will require in its new location a proximity to a good supply of No. 1 Railroad Wrought Scrap, good low sulphur Bituminous Coal and competing railroad facilities. The plant now occupies about seven acres, but it is expected that more ground will be required for the new plant. About 350 hands are employed. There is no doubt that many places which are in a position to meet these requirements will be glad to do what they can to secure the addition of this important establishment to local industries.

JOHN E. FORSEE, a well-known Hardwareman of the Middle West, died recently at his home in St. Louis, Mo. Mr. Forsee was born at Frankfort, Ky., in 1852. At the age of 16 he entered the employ of D. M. Thomas & Co. of Louisville, Ky., remaining with this firm until he was 19, when he removed to St. Joseph, Mo., and entered the employ of Wyeth & Jordan, which later became the Wyeth Hardware & Mfg. Company, of which he was made general manager. Mr. Forsee remained with this company until 1890, when he became identified with Janney, Semple, Hill & Co., of Minneapolis. In 1893 he removed to St. Louis, where he had since acted as manufacturers' agent. At the time of his death he was sales manager for the Carondolet Foundry Company of St. Louis, as well as several other companies manufacturing Shelf Hardware and specialties located in the Eastern States.

THE eleventh annual convention of the Texas Hardware Jobbers' Association will be held at the Worth Hotel, Fort Worth, Tex., on May 16, 17 and 18. An interesting and attractive programme has been prepared, and a large attendance of the members is expected.

FIRE on the 27th ult. destroyed the buildings of the Ashtabula Mfg. Company and the American Snap Company, Ashtabula, Ohio. Both companies will rebuild at once. They are putting up temporary buildings and expect to be in shape to fill all orders by June 1.

THE TROUT HARDWARE COMPANY, Chicago, Ill., has leased and taken possession of the building adjoining its present quarters on the west, which was formerly occupied by the Beckley-Ralston Company. The acquisition of this building gives the company about 50 per cent. additional floor space and will allow of a better handling of its increasing trade. The front half of the first floor of the new addition will be devoted to Cutlery, Sporting Goods, Fishing Tackle and similar stock, and the rear half will be used for laying out city orders and taking care of all city business. The building has been leased for one year, with an optional extension clause of from five to ten years. The company states that it has been badly crowded through lack of sufficient floor area for the past two years and will be greatly aided in the execution of business by the added room, particularly with trade at the present high point.

THE Hayward Building, San Francisco, is an object of interest to the building crafts at present on account of having survived almost unscathed the effects of both the 'quake and the fire which followed. This building, 11 stories high, stands a monument to the efficiency of steel construction and to the system with which it was fireproofed. Although its neighbors were all shaken or burned to the ground this structure can be restored to its original condition for the comparatively trifling sum of $5000 to $8000. The patented Prong Lock Wireless fireproofing system which was used in the building is made by the Berger Mfg. Company, Canton, Ohio, who report that this fireproofing is being specified by many architects and engineers throughout the country.

CARY SPRING WORKS, 240-242 West Twenty-ninth street, New York, has issued an illustrated booklet, envelope size, showing some of the many leading kinds of Springs, including flat spiral, compression, extension, torsion, cone, flat, &c. At the back is a valuable table, original with the company, giving the number of feet of flat wire per pound in 22 thicknesses from 0.010 to 0.020, consecutively, and in 24 widths from ⅛ to 2 inch, inclusive.

R. W. JAMIESON COMPANY, formerly at 96 Church street, New York, manufacturer of Patent Bread Mixers and Nail Clippers, has moved its plant and office to 288 Washington street.

SAN FRANCISCO HARDWARE AND METAL TRADE.

ADVICES from San Francisco indicate increased energy in the rehabilitation of Hardware and metal headquarters, necessarily primitive and crude at first, but nevertheless established and busy.

RESUMING BUSINESS.

E. C. Atkins & Co., Saws and Machine Knives, are receiving stock daily at 1055 Broadway, Oakland, R. W. Neighbor, manager. The Union Metallic Cartridge Company and Remington Arms Company, which will have a larger stock than ever and make prompt shipment, are at 1108 Broadway, Oakland, E. E. Drake, manager. The Wright Wire Company is at 1056 Broadway, Oakland. The Colorado Fuel & Iron Company, W. A. Wetmore, manager, is at 232 Bacon Block, Oakland. The Morgan & Allen Company, representing the Oneida Community, Kenwood, N. Y., and the Goodell Company, Antrim, N. H., is at 217-220 Woodman Building, Oakland.

John H. Graham & Co. have offices at 2108 San Antonio avenue, Alameda (a suburb of Oakland), in charge of William J. Maharg. The George F. Eberhard Company, Pacific Coast distributer for the Cleveland Stone Company, Dover Mfg. Company, Upson Nut Company, James H. Mann, Robert H. Ingersoll & Bro., Morton Safety Razor Company, &c., is at 2431 Dana street, Berkeley, Cal., a suburb of San Francisco.

The Palace Hardware Company has headquarters at 942 Magnolia street, Oakland. The Paraffine Paint Company, R. S. Shainwald, secretary, has rooms 405-408 Union Savings Bank Building, Oakland. Its factory at Paraffine Station was uninjured and rail shipping facilities are unimpaired. The company is prepared to fill all orders promptly and has complete stocks of roofings, building papers, sheathings, felts and paints.

The Hammer-Bray Company, Stoves and Ranges, is located at Twelfth and Castro streets, Oakland, and was shipping orders two days after the fire. The Paul Seiler Electrical Works, Electrical Supplies and Wire, is at 616 Eighth street, Oakland. Messrs. Berger and Carter of the Berger-Carter Company, San Francisco, announce that they have started anew at Third and Washington streets, Oakland.

The Phœnix Hardware Company, 6 Mission street, San Francisco, has just been formed by W. D. Caldwell and Fred R. Browne, late employees of Baker & Hamilton, San Francisco. Mr. Caldwell had been employed by the latter house as buyer and sales manager. The new firm, which will give particular attention to Machine Shop Supplies, requests from manufacturers the prompt sending of catalogues and prices. It will also seek to represent manufacturers as selling agent.

W. A. Etting, Hardware merchant, late of 110 Sixth street, San Francisco, requests catalogues and price-lists of mechanics' tools, Builders' and Cabinet Hardware and kindred goods. He may be addressed at 358 Lexington avenue, San Francisco.

Dunham, Carrigan & Hayden Company renews the request that manufacturers not only send in duplicate copies of all invoices issued to it since January 1, but that catalogues and price-lists, in duplicate, of Hardware and kindred lines will be particularly acceptable. They may be sent to the company at 131 Kansas street, San Francisco.

Among the retail Hardware stores destroyed were those of the Osborn Hardware & Tool Company, Palace Hardware Company, Alexander Yost Company, C. H. Philpott Company, Wright Hardware Company, Bennett Bros., Henry Gracey, Seller Bros. & Co., Joost Bros., S. J. Dean and Buchanan Bros.

THE RALPH BROWN COMPANY.

Mr. Ralph Brown, of the Ralph Brown Company, whose warehouse at San Francisco was destroyed in the recent catastrophe, is now in the east taking energetic measures for the resumption of the business so rudely interrupted. Mr. Brown expresses himself enthusiastically and in the most appreciative terms in regard to the words of sympathy and tenders of help which come to his company from manufacturers and others in the trade—in many cases indeed from houses with which it had had little or no business dealings. Mr. Brown's arrangements are nearly completed and he expects to be in San Francisco on May 30 with a new stock of goods, ready to continue business on the old lines.

CHARLES W. GAUSE.

Charles W. Gause, recently with the Dunham, Carrigan & Hayden Company in San Francisco, telegraphs that he has resigned his position with that house and is considering various propositions, including factory representation. Mr. Gause will be remembered by the trade as for several years a buyer with the Simmons Hardware Company, St. Louis, Mo., before he came East to identify himself with one of the New York buying concerns preceding his identification with the New York branch of Dunham, Carrigan & Hayden Company, from which he went to the main house in San Francisco. A thorough Hardwareman of ability and character, Mr. Gause will have the best wishes of many friends for his success in the new plans he is making.

BUTLER BROS.' MINNEAPOLIS HOUSE.

BUTLER BROS., wholesalers of general merchandise by catalogue only, have decided to open a fourth full fledged house, to be located in Minneapolis, Minn. Contracts have been let for a new 13-acre building, of which possession is guaranteed in time for them to open early in 1907. Butler Bros. have had their eye on the Northwest for several years as a section worthy of one of their houses. Since 1903 they have maintained a very complete sample room in St. Paul, and the results have been so satisfactory that the new house follows as a natural step. The buying for all houses will continue to be done through their central buying organization at New York and the selling through their central catalogue department at Chicago. In every aspect of distribution the Minneapolis house will start out full grown. In lines handled and in stocks carried it will be as complete as the houses now maintained at New York, St. Louis and Chicago.

The new building, we are advised, will be the largest under one roof in the Twin Cities occupied by a single mercantile concern. The site is on Sixth street, extending from First avenue North to Second avenue North, the ground area being 173 x 330 feet. The building will be eight stories and basement, making a total of 513,000 square feet (nearly 13 acres) of floor space. There will be a direct railroad track running through the entire length of the building, connecting with the Minneapolis & St. Louis Railway. The building will be of mill construction, with sprinkler system, the first two stories of vitrified paving brick, upper stories of red brick, relieved by alternate courses of contrasting effect. There will be an ornate marble entrance, ten roomy elevators—eight for freight, with a speed of 250 feet per minute, and two for passengers, with a speed of 300 feet per minute. The building throughout will be equipped with the latest improved devices for doing a jobbing business with the utmost economy and dispatch. The sample rooms will be located on the top floor. A unique feature of the roof will be saw-tooth skylights, arranged to admit light from the north, so that this top floor will be as light as day and yet without shadows, because it will receive none of the direct sun rays. It is this part of the house that will particularly concern merchants, for here their purchases will be made, and the natural light thus admitted will be the best possible for the careful examination of all sorts of merchandise.

ANNOUNCEMENT is received of the death of John A. McIntosh, Ravenswood, W. Va. He was a prominent citizen of his town and county and a veteran Hardwareman, having a fine wholesale and retail store in Ravenswood, with a branch in Spencer. He was a man of strong mind and aggressive character. He was in the sixty-second year of his age.

W. W. HUMASON, representing Humason & Beckley Mfg. Company, New Britain, Conn., is now permanently located at 23 Warren street.

SALE OF THE ST. LOUIS RETAIL STORE OF THE SIMMONS HARDWARE COMPANY.

THE SIMMONS HARDWARE COMPANY has disposed of its retail store in St. Louis, and will hereafter carry on an exclusively wholesale business. Its reasons for this and the spirit in which it takes this action are given in the following letter addressed by E. C. Simmons to the retail Hardware merchants in that city. It will be read with peculiar interest as explaining an important and significant transaction, and touching, indeed, upon questions which are of interest to Hardware merchants in every part of the country:

This is to advise you that we have sold our retail business which has been so long in existence at the corner of Broadway and St. Charles street. We have sold it out completely—retiring absolutely and wholly from the retail business—and have done this in order to harmonize our views with those of the retail dealers of St. Louis and the cities adjacent.

Some of the retail Hardware merchants of this city have for a long time contended that our retail store was an injury to their business. We have never admitted this contention, nor do we now, because we believe that this store has been a great protection to the retail Hardware trade of St. Louis, and if this store had not been in existence department stores would have had large Hardware departments pursuing "cut-throat" methods which would have been of vastly more injury to the retail Hardware dealers of St. Louis than our retail business has been. However, we have failed to convince all the retail Hardware merchants of this city on this point, and while we have no apologies whatever to offer, because we still maintain we are right, we have decided to yield to the wishes of the trade that patronize us in our wholesale business and to whom that business is indebted for its growth and support during these many years, and have sold our retail business entirely in the following manner:

We were offered a very satisfactory price for the business as a whole—which included the Hardware department—but as the parties making the offer expected to conduct it as a part of a very large department store, we distinctly rejected the proposition to sell the Hardware department to them, and did so for the sole reason that we believed such a sale would result to the injury of the retail Hardware dealers of our city. After some considerable negotiation we sold the other parts of the business, which includes Housefurnishing Goods, Silver Ware, China, Cut Glass, Sporting Goods, Leather Goods, Harness, &c., to the syndicate that expects to occupy the enormous building to be erected on Olive, Locust and Tenth streets as a department store of great magnitude, and we sold the Hardware department (entire) to Schroeter Bros. Hardware Company at a far less price than we could have obtained for it from the syndicate to whom we sold the rest of the business. Our reason for doing this was absolutely one of protection to the Hardware trade. Whether we can convince the trade as a whole of that remains to be seen. We make the statement broadly and ask the retail merchants to accept it as true because it is true, standing ready to make on personal application any explanation that they may desire. We sold it to the Schroeter Bros. Hardware Company FOR CASH because they were distinctly a Hardware house and not a catalogue house, but they are successful Hardware merchants, conducting the business upon legitimate Hardware principles.

Schroeter Bros. Hardware Company have never been particularly friendly to this company, because they have always regarded our retail store as a competitor. As a matter of fact, they bought six times as many goods from one of our competitors in the year 1905 as they did from us, not because they could get better prices, but simply because they did not want to patronize us when we had a retail store that was their strong competitor. I mentioned this fact simply to show that they had no particular love or affection for this house. They said to us that the reason they did not buy more goods of us was from no particular unfriendliness, but simply because they did not want to patronize a house that had a retail store that was their competitor.

We shall take no interest whatever in either the syndicate business or Schroeter Bros. Hardware Company—both are entirely independent concerns, possessed of ample capital to conduct the business successfully, and we believe they will both be successful. We are firmly convinced that our arrangements in this matter have prevented the putting into a large department store—the largest west of the Mississippi River—a great department of Hardware which would have been injurious to the retail Hardware dealers of St. Louis.

We do not own a dollar's worth of stock in the Schroeter Bros. Hardware Company, and our only interest in that concern will be the same as it is in any other sound institution in this city who buy and sell our line of goods, and that is the interest of selling them as many goods as we can at a reasonable profit to ourselves, and which we shall certainly strive to do. They are under no obligation to buy from us—they are absolutely untrammeled and foot loose in this respect, and just as free as any other dealer in the city of St. Louis to buy where they think they can do the best.

We think it fair to state that a large number of the retail Hardware dealers of St. Louis have openly expressed their approbation of our retail store, because we conducted it upon legitimate retail principles, because we never cut prices and because we have never advertised a dollar's worth of Hardware at cut prices. On the other hand, a number of them have voluntarily told us that we were a protection to them, that the prices we asked for Hardware, &c., in our retail store were full prices and entirely satisfactory to them.

There was another element, however, not in the majority, that were constantly saying the store was an injury to them, and we thought it wise to yield to public opinion by selling out the store which had always been successful from the time it started in 1880, and which has therefore been in existence a quarter of a century, and during all that time it has been conducted in a manner that commands our own respect because it has always been done in a way to protect the interests of the retail Hardware dealers as we look at it.

It may interest you to know why this retail branch was started originally, which was this: In the year 1879 several architects came to the founder of this business stating that there were no good stocks of Builders' Hardware kept in St. Louis at that time; that they were compelled to get their goods from the factories; that the service was imperfect and slow and unsatisfactory, and they begged of us to open a retail branch where we could give them good service, and it was in response to that appeal that we opened the store, which of course, has grown from a small beginning to its present magnitude. We don't hesitate to say that in our judgment it has been the largest, the best and the most successful retail Hardware business that was ever established in the world. We confidently believe that if this store had been organized and carried on in the city of New York in the same manner as it was done in St. Louis it would have been a "gold mine" in point of profits.

The president has asked me to write you this letter simply because I started this retail department in the year 1880, a quarter of a century ago, and have taken an active interest in it, have indorsed it and backed it up from the time it started until the present, and also because I voluntarily recommended that we sell it out and try and satisfy the retail Hardware dealers of this city that we were disposed to meet their views. Therefore, I hope you will receive this letter as being intended to set at rest in your minds once for all that we are entirely out of the retail Hardware business, and that our sympathies and good will go out in full measure to the retail Hardware merchants of this city, whether they are patrons of ours or whether they are not.

I beg further to state that I expect to be in my office on the corner of Ninth and Spruce streets every day during the balance of this month—May—between the hours of 10 and 12 a.m., and I cordially invite any retail Hardware merchant in this city to call to see me and talk this matter over if there is any point in connection with the closing of this store or its conduct in the past that is not clearly understood or upon which he wants any information.

Soliciting your favorable consideration of these facts and thanking all who have given our house such a liberal patronage in times past for their friendship and trade, and with the assurance that Simmons Hardware Company will do its level best to help them to prosper in future, I remain, with great respect and sincere good wishes, cordially yours, E. C. SIMMONS,

FOR SIMMONS HARDWARE COMPANY.

J. H. GILHULY, Pacific Coast sales agent for Stanley G. Flagg & Co., Philadelphia, Youngstown Sheet & Tube Company, Youngstown, Ohio, and other Eastern companies, has taken with him as a partner A. B. Ambler, formerly manager of the iron and pipe department of the Pacific Hardware & Steel Company, San Francisco. The new firm, under the style of Gilhuly & Ambler, will have headquarters at 421 Market street, San Francisco, and will visit the Pacific Coast jobbing trade at regular intervals. It is the intention to take on a few new accounts. The members of the firm will have the best wishes of many friends in the trade for their success.

FACTORY COST AND BUSINESS METHODS.

THE PRACTICAL APPLICATION OF FACTORY COST SYSTEMS.

BY GUY P. MILLER.

IN the good old days when competition was not quite so keen and margins of profit were large it was considered a waste of good money to pay salaries to "dead heads" to figure costs. It was considered sufficient if the results for a year's business were on the right side of the ledger. As competition increased, however, the necessity was realized of following more closely all the details in connection with the business. As the business increased it gradually became apparent that it would require a prodigy to carry in his head all the details of the business, and the old-fashioned one-man concern realized its limitations. It was found impossible for any one man to carry "under his hat" all of the knowledge necessary to get the best results. It was found necessary to record and tabulate facts. You are of course aware that facts and opinions often differ widely.

Old Methods vs. New.

Under the old time one-man system the business was run, from the president down, principally on guesses, shrewd and close guesses many times, but guesses just the same. Great was the power of bluff in those days, and in many cases it is to-day, although it is gradually growing less as it is more frequently being called. Another weakness of the one-man system was the possibility of the one man becoming incapacitated or dying and carrying with him the knowledge which he had taken years to acquire.

The argument most frequently used against modern methods—that is, that the cost exceeds the value of the results—will not hold water except on the ground of incompetency of the users. No one would think of giving fine edged tools to a man unacquainted with their use without giving careful instructions as to how they should be used and without making sure that the instructions were understood. Very frequently, however, we have examples of concerns which, having become dissatisfied with existing conditions and feeling the need of more information, decide to put in a new system. They detail this work to some one who is in no way fitted to assume it, usually to the bookkeeper, who is already so overloaded with detail that he has no time to think. He studies the proposition during his spare moments and evenings, and very likely makes some very good suggestions, but almost surely meets with opposition—both in the office and factory. If he is unable to successfully cope with the opposition, many times the system is condemned and thrown out altogether.

Misdirected Effort

Good Cost System a Valuable Asset.

A factory cost system properly installed and properly managed can, with the co-operation of office and factory, be made one of the concern's most valuable assets. True, it costs money, but if it does not save much more than it costs it is due to faulty management. Every clerk or nonproducer should be looked at for investment purpose as a machine, and if the value of his product will not pay a dividend on the investment cut out that product. There should be no hesitation, however, about adding to the clerical force if the results prove the advisability of such additions. Stockholders do not care how the pay roll is distributed; they are looking for dividends. If by increasing the clerical force by two men the producing force can be reduced by ten men, no time should be lost in doing it. It is the final result at the end of the year that determines the success of a business.

Nonproductive Labor

A successful cost system shows up clearly the cost of each article manufactured for comparison with the selling price, making it possible to push profitable lines in preference to those that are not so profitable. The total costs of all goods shipped over a period of, for instance, a month deducted from the net sales for a month enable one to determine the monthly profit or loss. Comparisons of costs in fullest detail make it possible to pick out the weak spots and remedy them. Losses in material and labor are constantly brought to the attention of the manager in a routine way, and these records being in such shape that the responsibility can be directly placed, results are bound to be secured. From the costs numerous statistics are made up, giving the performance of the individual workman (meaning the amount of work done in a given time), making it possible to gradually weed out the poor men and adjust the matter of wages equitably.

Discovering Weak Spots

A cost system is a constant spur to every employee in the factory, from the superintendent down, because of the fact that each man knows his record is on file in the office and regularly furnished to his immediate superior for comparison with past efforts of his own and with the efforts of other employees on the same class of work. In this way the data is furnished on which action may be taken. A running inventory is kept at all times and weekly and monthly reports show the conditions, whether stock is being increased or diminished and in what department, so that the minimum amount of money may be employed to secure the maximum results.

Spur to Employees

There is one statement that should be particularly emphasized—viz., a cost system is nothing more nor less than a series of memoranda unless it proves itself correct at regular intervals and is embodied as a part of the main books of the company. The best check on the value of a cost system is the closeness of the total of the running inventory taken at the end of the year, for the reason that the nearer correct the costs are in total the nearer will the estimated or running inventory check up with the actual. It is of course necessary to check the figures so far as possible at shorter intervals.

System Must Prove

Charges Grouped Under Order Numbers.

Most cost systems are based on grouping the costs of material and labor on an article, or group of articles, to an order number. An order bearing a serial number is issued to foremen of the various departments concerned instructing them to make a certain number of pieces of a certain article, charging all material and labor to the number given on the order. All of these charges are grouped to the order numbers in the office and the accuracy of the work checked by balancing the total weekly charges of labor to order numbers with the weekly payroll, and the total material charges with the record of the department which delivered it, which, of course, in a large factory would be the stores department.

It is not my purpose to emphasize the value of any particular cost system, as a system which would be satisfactory in one line of business might be the reverse in another. The system must be made to meet the conditions and not the conditions made to meet the system. A system which in any way retards or interferes with the progress of work through the shop is burdened with red tape. Red tape and system are not synonymous terms, although many people think they are. John F. Wallace, in speaking of the red tape in connection with handling governmental affairs, said: "What is ordinarily designated as Government red tape is simply system gone to seed; it is due to the persistent tendency of the person applying that system to give greater consideration to the form and the routine than to the accomplishment of the results the system was designed to maintain."

Requirements Vary

Red Tape

Aids in Compilation.

One of the greatest aids to the economical and accurate compiling of facts is the adding machine, of which there are many styles now on the market ranging in price from $5 to $350. There are also several styles of machines for multiplication and division which are very ingenious and save much time and brain fag. In some of

the largest factories in the country the electric tabulating machine is producing marvellous results. This machine was first used in connection with the tabulation of statistics of agriculture from the census of 1900. The data to be tabulated is accumulated on punched cards and these cards fed through the machines as many times as there are facts to be tabulated; the machine adds the various items. Of course, this machine can only be used to advantage where there are a very large number of cards to be handled, just as gang tools turning out many more pieces in a given length of time than single tools can only be used to advantage when there are sufficient number of pieces to be made to make it pay.

Tabulating Machine

An instrument which saves a great deal of time in performing various mathematical operations is the slide rule which is used considerably by engineers, but at the present time its use is quite limited for cost accounting purposes. For the benefit of those who may not be familiar with this valuable little instrument, it may be explained that it consists of two graduated and numbered pieces of wood, one of which slides in a groove in the other. It is used for computing surfaces, solids, &c., and is very convenient for multiplication and division where approximate figures are sufficient, also for checking purposes.

Slide Rule

Time clocks play an important part in connection with modern cost methods. There are many styles of these on the market, some of which are arranged simply to keep track of the total time worked, while others are used to keep time of each job. Where the former are used, the total time rung up on the clock by each workman is checked with the total time reported on his labor cards to jobs or order numbers. Where the time clock is used for cost keeping purposes the time on each job is kept by having the workman take a card to the clock to be registered at the time of starting a job, and again at the time of completion. There are many arguments in favor and many against the cost keeping clock, and each manufacturer must decide for himself what style of clock is best adapted to his business. Many advocates are to be found of each of the

Time Clocks

THREE METHODS OF KEEPING RECORDS,

by means of books, by means of cards, and by means of loose leaves or sheets. None of these systems is for all purposes, and in all places superior to the other two, and it is well to listen doubtfully to the talk of the systematizer who endeavors to persuade one that his system has all the advantages. There is danger of being tied up with a lot of forms punched with a special shape of punch so as to fit patented binders, making it necessary to always purchase the forms and binders from the same place without the advantage of competition.

IN CASE OF FIRE LOSS

the cash value of complete records is greatly appreciated, for it is possible to furnish a complete list of all the machinery, tools and fixtures, as well as the cost of the stock in process in the burned building. The ability to furnish such a record furnishes the proof which is necessary to secure a good settlement. Many manufacturers are especially attracted by this very important feature of a complete cost system, and feel that it pays on account of the protection thus secured to keep the necessary records outside of their value for other purposes.

A Practical Illustration.

The following will serve to illustrate the value of knowing at all times what the costs are in each department. It has been the custom in one department of a certain factory for the foreman to estimate the cost of labor on articles which passed through his room, and also the amount of supplies used, although the total of these estimates had not been checked with the total pay roll and total supplies used. The first month that such a check was made by figuring an estimated cost of the production of the department based on the foreman's estimates, the total of these estimates did not equal the total pay roll of the department plus the supplies used by some 30 per cent. The foreman, upon being advised of the results, stated at once that he would stand by his estimates and that the costs were too high. He found upon investigation that the work in his department had gradually fallen off and that his force had not been reduced. He immediately laid off five men, thus making a saving he would not have made if he had not been furnished with the facts.

ED. FORD ON TRADE QUESTIONS.

Letter No. 5.

Hardware Associations and Their Help to Members.

To the Editor: At a recent convention the question was raised, "Has any good come out of your Hardware convention?"

It seems to me such questions should not be brought up, as they are liable to cause doubt regarding association benefits among outside merchants, and especially those who contemplate joining and are "almost persuaded."

I think there is no question in the minds of those who have watched association work, but that the co-operation and intelligent efforts of association members have resulted in great good, not only to the members, but outsiders as well.

IN NUMBERS THERE IS STRENGTH,

and the united strength of the different associations has done much to prevent the enactment of the injurious parcels post legislation, assisted by the able and timely co-operation of *The Iron Age* and its Washington correspondent.

The proposed parcels post bill, making Uncle Sam carry merchandise at a loss, is a darker cloud on the commercial horizon than the retail merchants realize; it overshadows the catalogue house problem and all other troubles of the retailers.

If it becomes a law and 11 pounds can be shipped to the remotest parts of our country for 25 cents, many of the retail merchants in the towns and villages will be driven out of business. Trade will become more and more centralized in the larger cities.

The associations have done more than anything else to awaken the interest of retailers in general, and have up to the present time prevented unfavorable legislation.

RETAIL ASSOCIATIONS HAVE DONE MORE

during the past five years for their members to free them from catalogue house competition than they realize, but not by any means in the manner they appear to think.

They have not in any way crippled the retail catalogue house, even in the Hardware department. They have caused the catalogue house some inconvenience, but in return the catalogue house has retaliated, so up to date it is a draw. But the associations have succeeded in arousing the retailer to the necessity of modernizing his business and working on twentieth century lines.

Retailers, like all others, will always have their troubles, but catalogue house competition is not as aggravating to the up to date merchant of to-day as hundreds of other annoyances, and the change is not because the catalogue house is crippled, but because the retail merchants have been aroused from their lethargy.

Conditions change—business methods change, and we must change with them—because our fathers were successful merchants is no reason why we should do business as they did.

The associations have advocated judicious advertising and tried to show how to do so successfully. The trade papers are doing much to educate the trade as to how to write good copy and to show up what is poor and unprofitable advertising.

IMPORTANCE OF ADVERTISING PRICES.

We are going through an advertising age, so to speak, and although a great amount of money is wasted in advertising, good advertising pays. Advertise prices. Some may say, "You put your competitor wise," but the catalogue house is a strong competitor, as are the department stores. They always advertise prices—it is their strong drawing card—Mr. Retailer, "go thou and do likewise."

Mark goods in plain figures. How often we have been

attracted into a store by seeing an article we wanted in the show window priced. How much more interesting to us are window displays showing prices than those showing goods without prices. If we are attracted into other stores by goods priced in windows, will not people be invited into the Hardware store if a proper window display of new goods or leaders is made? Some say, "My competitor will see what I am doing and go me one better." Any retailer who handles his competitor in this way had better move to a town where he would have the only Hardware stock and then divide his trade with the catalogue houses, for it is because of such "dealers"—not merchants—and their methods that the large retail catalogue houses thrive.

The associations are of untold benefit to the Hardware trade. They are educators, and for the limited time they have been in existence have accomplished more than could reasonably have been hoped for, and they have only fairly started. Caution is necessary, however, and antagonism should be avoided. It would be a serious mistake to unnecessarily antagonize their friends and co-workers, the jobbers, manufacturers, and especially the trade press. ED. FORD.

REQUESTS FOR CATALOGUES, &c.

The trade is given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.

REQUESTS for catalogues, price-lists, quotations, &c., have been received from the following houses, with whom manufacturers may desire to communicate:

FROM JAMES JIMERSON, Sulphur Rock, Ark., who has bought the Hardware store of George Martin.

FROM VIRGINIA IMPLEMENT & HARDWARE COMPANY, South Boston, Va., which will add to its stock of General Hardware and Specialties.

FROM WELLS & HUBBARD, Pavilion, N. Y., who desire printed matter and quotations relating to natural gas goods, including Cooking and Heating Stoves, Chandeliers, Burners, Mantles, Globes, Brackets, &c.

FROM WILLIS & HOOK, Bedford, Iowa, successors to C. L. Willis in the Hardware, Stove, furniture and Sporting Goods business.

FROM STAEHLE & Co., Earlville, Iowa, who have succeeded to the Hardware business of Geo. Staehle & Son.

FROM PRATT-SHELDON HARDWARE COMPANY, Westfield, N. Y., which has recently purchased the Hardware business of L. W. Chapman.

FROM ALLIANCE HARDWARE COMPANY, Alliance, Ohio, which has been incorporated with a capital of $25,000. The officers are W. H. Hamsey, president; J. B. Crowl, vice-president, and B. C. Bates, secretary-treasurer. Mr. Ramsey is also secretary-treasurer of Morgan Engineering Company, Alliance, and Mr. Bates has been connected with the McIntosh Hardware Corporation, Cleveland, for the past 25 years.

FROM METHVIN HARDWARE COMPANY, Columbus, Ga., successors to the Columbus branch of King Hardware Company of Atlanta.

FROM TALLEY HARDWARE COMPANY, Porter I. T., which has bought out the interest of H. H. Talley.

FROM H. T. SMITHDEAL, Spencer, N. C., who has purchased the Hardware stock of the late Sidney Risdon.

FROM G. H. ELLIS, successor to Lee T. Miller, Aliceville, Kan.

FROM J. H. MCGRATH HARDWARE COMPANY, Hastings, Neb.

FROM KUNZ & HARTZ, who have opened a new Hardware, Stove, Implement and Sporting Goods store at Mabton, Wash.

PRICE-LISTS, CIRCULARS, &c.

Manufacturers in Hardware and related lines are requested to send us copies of catalogues, price-lists, &c., for our catalogue department in New York; and at the same time to call our attention to any new goods or additions to their lines, of which appropriate mention will be made, besides the brief reference to the catalogue or price-list in this column.

THE DUFF MFG. COMPANY, Pittsburgh, Pa.: Catalogue of 80 pages illustrating and describing Barrett's patent compound Lever Jacks and Duff Roller Bearing Screw Jacks.

SPRAGUE ELECTRIC COMPANY, 527-531 West Thirty-fourth street, New York: Catalogue of Electric Fans, showing in addition to direct current Fan Motors heretofore made by the company a new line of alternating current Electric Fans of both desk and braket types.

BILLINGS & SPENCER COMPANY, Hartford, Conn.; Booklet illustrating and listing a number of specialties, including Magazine Screw Drivers, Sportsman's Knife, Combination Pliers, Wrenches, &c.

E. F. REECE COMPANY, Greenfield, Mass.: Catalogue No. 6, referring to Screw Cutting Tools and Machines and Bolt Cutting and Nut Tapping Machinery.

LUITINK & SONS MFG. COMPANY, Milwaukee, Wis.: Descriptive catalogue of Adjustable Sliding Door Track and Hanger.

SIMPLEX TIME RECORDER COMPANY, Gardner, Mass.: Illustrated catalogue of Simplex Time Recorders and Watchman's Clocks, with inserts of duplicate record sheets.

WILEY & RUSSELL MFG. COMPANY, Greenfield, Mass.: Price-list circular of Lightning Full Mounted and Green River Screw Plates.

MERIDEN CUTLERY COMPANY, Meriden, Conn., and 10 Warren street, New York: Booklet referring to its Anvil Brand Table Cutlery and Butcher Knives and other lines.

GRAHAM MFG. COMPANY, Derby, Conn.: Illustrated catalogue of cylinder Key Blanks.

IMPERIAL BRASS MFG. COMPANY, Chicago: Large mailing circular, illustrating and listing Automobile Pumps, Automatic Lamp Adjusters and other specialties.

BUTLER BROTHERS, New York, Chicago and St. Louis: May issue of "Our Drummer," calling attention to their immense stock and assortment of general merchandise sold to retail stores exclusively. The May features are notion sale, $4.50 sale, white sale and fireworks.

CARBORUNDUM COMPANY, Niagara Falls, N. Y.: Booklet entitled "The Hardest and Sharpest," referring to Carborundum Sharpening Stones.

STAR BRASS WORKS, Chicago: Illustrated catalogue of Binks' Star Whitewashing and Painting Machines.

SENOUR MFG. COMPANY, Chicago and Montreal: Dealers' catalogue and price-list of Mixed Paints, Enamels, Stains, Fillers, Varnishes, Coach Colors, Putty, Colors in Oils, &c.; also color card of Monarch Mixed Paint and Senour's Floor Paint and circulars referring to Martin's White Enamel, &c.

BUTTERFIELD & Co., Derby Line, Vt., and Rock Island, Canada: 1906 catalogue of Taps, Stocks and Dies, Screw Plates, Reamers, Young's Axle Cutter and Tools for engineers' and steam fitters' use.

HUMPHRYES MFG. COMPANY, Mansfield, Ohio: Booklet entitled "Your Own Water Works System," referring to Humphryes' Hydraulic Ram; also booklet referring to Hercules Compressed Air Painting Machine and Spray Pump.

TWENTIETH CENTURY MFG. COMPANY, 19 Warren street, New York: Circular referring to Bicycle, Motor Cycle and Automobile Oil and Gas Lamps, Searchlights, &c.

GOULDS MFG. COMPANY, Seneca Falls, N. Y.: Illustrated catalogue containing price-lists of Hand and Power Sprayers for orchardists, nurserymen, market gardeners, florists, &c., with valuable information and practical suggestions regarding use.

DUCHARMES & Co., Shelburne Falls, Mass.: Catalogue of Screw Drivers, Awls, Nail Sets, Punches and other Tools.

The Hardware Store of Neal & Brinker Company.

SIXTH ARTICLE.

AS stated in the previous article of this series, compartments and drawers in the ledges and shelving were subdivided with much care to accommodate various lines of goods with the greatest economy of space. Before

Fig. 36.—Compartment Drawer for Perfect Handle Screw Drivers.

putting in partitions it was of course necessary to have all the articles which a given space must contain and lay them out in various ways until the best possible arrangement was decided on. A good example of a compartment partitioned for the most advantageous accommodation of goods is afforded by the drawer devoted to

Fig. 37.—Stock of Hack Saw Blades in Drawer 14 Inches Wide by 14 Inches Deep.

Screw Drivers, Fig. 36. It will be observed that five different sizes are contained in the drawer, as shown by samples on the front. They are placed end to end so that the blades overlap and the handles occupy both ends of the compartments, thus increasing their capacity to a considerable extent. Hack Saw Blades, Fig. 37, are kept

Fig. 38.—Butcher Saw Blades in Original Boxes, Separated by Square Screw Hooks.

in a drawer measuring 14 x 14 inches and divided into sections each containing two of three sizes, as indicated by the marking on the edge. This line is an example of those which do not require samples to be displayed, the drawer front merely being labeled to indicate the goods which it contains. An ingenious device will be noted in the drawer devoted to Butcher Saw Blades, Fig. 38. As these are usually kept in their original cardboard boxes, it is unnecessary to divide the drawer with partitions,

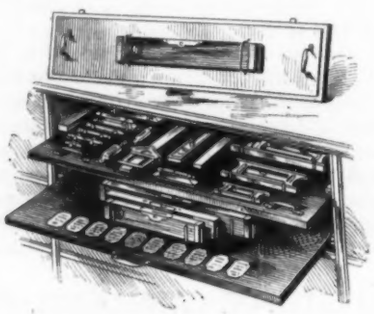


Fig. 39.—Samples of Spirit Levels on Cloth Covered Boards.

but the goods are placed on flat trays resting one upon another, and the different sizes of Blades are separated by square screw hooks screwed into the surface of the trays. This drawer is 14 inches wide and 32 inches deep to accommodate the longest blades. The very effective

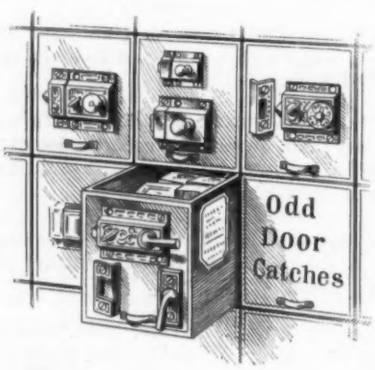


Fig. 40.—Shelf Boxes Containing Door and Cupboard Catches.

method of showing Spirit Levels is illustrated in Fig. 39. Behind the front board, which is removed and placed on the ledge, are two sliding boards or trays fitted with drawer pulls and covered with black cloth. On these sliding boards the Levels and Level Glasses are mounted in groups according to size and style, the smaller ones

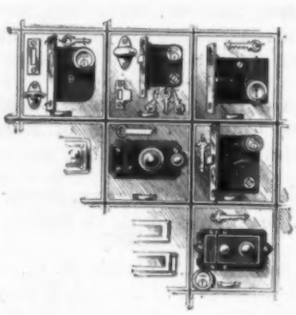


Fig. 41.—Locks and Night Latches, with Keys, Escutcheons, &c.

being held in place by spring clips and the larger ones by pegs at the sides and ends as indicated. Price labels will be observed pasted on the surface of the lower tray near the front.

Returning to lighter goods kept in the upper shelving, the method of accommodating and displaying Door and

Cupboard Catches is illustrated in Fig. 40. These are attached with screws to the front of the shelf boxes, although it is of course unnecessary to put in as many screws as would be required in actual use. For instance, a piece having four screw holes is held by two screws diagonally opposite. All component parts are shown, in-

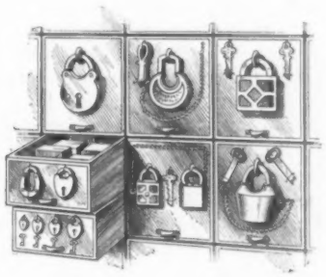


Fig. 42.—Samples of Padlocks Locked through Screw Eyes.

cluding outside latch turns, as in the case of the Screen Door Catch on the box that is half drawn out. The price label on the side of the box is also indicated, while adjoining is a catch-all box used for odd Door Catches and parts. A miscellaneous box of this character is used in connection with many lines and prevents a great deal of disorder.

In Fig. 41 are shown Locks, which are attached to

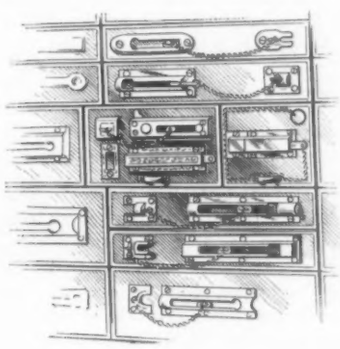


Fig. 43.—Chain Door Fasts, Chain Bolts, &c.

the front of shelf boxes in various ways. Some are wired, others are held by a long screw inserted in the opening for the spindle. Rim Locks, Night Latches, &c., are held by a couple of screws in the regular screw holes. The keys, turns and escutcheons which go with a lock are all shown so that a purchaser knows exactly what he will get.

Padlocks, Fig. 42, are fastened to the front of shelf boxes by lockig them through screw eyes. Keys accom-

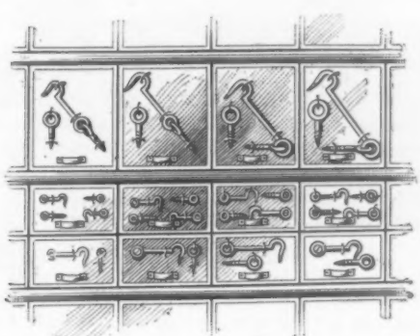


Fig. 44.—Small Shelf Boxes Containing Hooks and Eyes.

panying them and chains, if any, are held by small staples, care being taken to arrange them with an eye for the best effect. In the case of small Padlocks illustrated in the open boxes, two or more styles or sizes occupy the same shelf box in separate pasteboard boxes, as indicated.

Samples of Chain Door Fasts, &c., are illustrated in Fig. 43. These are attached with screws using only as many as necessary to hold the parts properly in place. Chains are allowed to hang naturally, or, as in the case of Chain Bolts, are neatly arranged on the box fronts and fastened with tacks or small staples.

The lightest and smallest stock is kept in the highest

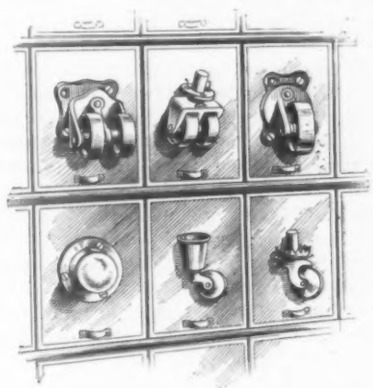


Fig. 45.—Method of Displaying Casters.

tiers of shelving. Such a line is Hooks and Eyes, illustrated in Fig. 44. Very small shelf boxes are used for these goods, the samples being attached on the front with small staples. Gate Hooks and Eyes, shown in the upper row of boxes, are fastened with wire loops.

In displaying Casters, Fig. 45, those fastening with a screw plate are held by a couple of screws. Other styles, not adapted to this method, are wired in the usual way.

Samples of Tape Measures, displayed on the front of

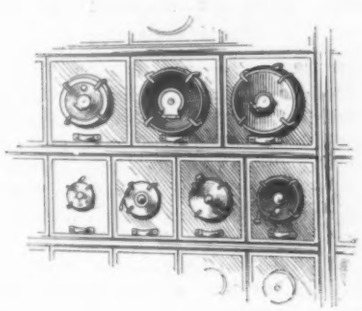


Fig. 46.—Tape Measures Held in Place by Screw Hooks.

shelf boxes containing stock are shown in Fig. 46. These samples, it will be observed, are held by four square screw hooks placed diagonally opposite each other. This method of attachment is convenient and does not scar the highly finished cases.

A. S. MORSS COMPANY'S MARINE HARDWARE CATALOGUE.

A. S. MORSS COMPANY, Boston, Mass., has issued a cloth bound catalogue, 7 x 10 inches in size, containing 450 pages, illustrating and listing a very complete and comprehensive line of Marine Hardware, Boat Builders' Supplies, Motor Boat Fittings, Edge Tools and Ship and Yacht Supplies. A pocket catalogue has also been gotten out, which is an exact duplicate of the larger book, being made from reduced plates. These editions will doubtless be found exceedingly convenient by the customers of the firm, providing them with a complete manual of this line of goods.

T. K. Brantley & Sons, general merchants of Troy, Ala., handling plantation supplies, Implements, Vehicles, Harness, &c., have decided to add a line of Hardware at wholesale and retail.

HENRY M. GAY.

HENRY M. GAY of Milwaukee, Wis., who has lately accepted a responsible position with the Phillip Gross Hardware Company of that city and has given up the road, is one of the best known and probably the oldest (in years of service) Hardware traveling salesman in the Northwest. Mr. Gay started in the Hardware business in 1864 at McGregor, Iowa. He took to the road in 1867, and from 1869 to 1875 traveled Wisconsin and Iowa, largely by team, for K. & A. G. Sexton & Co. of Milwaukee. When that firm went out of business, Mr. Gay having had charge of closing out the stock, he identified himself with Biddle Hardware Company of Philadelphia, with which he remained for the period of 1875-1888. During this time he sold as much as $100,000 worth of goods a year to jobbers and large retailers. In the early 90's he was head salesman for Woodrough & Hanchett Company, Chicago, and upon that company's withdrawal from business Mr. Gay went with Wm. Frankfurth Hardware Company of Milwaukee for several years. During the past four years he has traveled for the Wells & Nellegar Company, Chicago, in eastern and central Wisconsin territory. For 20 years Mr. Gay visited the largest cities in Michigan, Wisconsin, Iowa and Minnesota, including Detroit, Grand Rapids, Milwaukee, St. Paul, Minneapolis, Dubuque, &c., but for the past ten years his relations have been mainly with the retail trade. The Phillip Gross Hardware Company, with which he has recently become affiliated, has been his customer since 1877. Of 300 firms to whom Mr. Gay sold goods from 1875 to 1888 there remain only 34, which moves him to remark that a successful salesman must keep adding to his list of patrons all the time to make up for those who drop out of the business.

MISCELLANEOUS NOTES.

Prong Lock Wireless System of Fireproof Partitions.

The Berger Mfg. Company, Canton, Ohio, has arranged to introduce in the East, through its New York office, 210 East Twenty-third street, its system of fireproof partitions, both hollow and solid, and ceiling furring. In the West the system has been in use for some time. A feature of the system is that the furring is not tied or wired. It consists of a system of metal sockets, one style made with projecting prongs, the other with slots, which are fixed in place at the floor and ceiling. The steel studding is slipped either into the slots in one style of socket or between the prongs of the other, as the case might be. The prongs are easily pressed back and clinch the studding in a rigid grip. The studs are provided at intervals of 6 or 8 inches with projecting prongs punched out of the steel. The wire or metal lath is placed on the studding, the prongs projecting through the mesh. A pressure of the thumb or the tap of a hammer clinches them back and grips the lath firmly to the studding. The furring is also made with projecting prongs and either nailed to wood joists or attached to steel I beams by a simple system of clips. The ceiling lath is clasped to the furring by the prongs in the same way as to the studding. The ease of erecting this system is said to make it economical, and as the prongs are immovable it is declared to be absolutely rigid.

Buck Brothers.

The new catalogue of Buck Brothers, Millbury, Mass., while not materially changing any of the list prices, illustrates some goods which were not shown in their previous catalogue, although they have made them for several years. These include firmer gouges, with outside and inside bevels, in regular, middle and flat sweep; paring chisels and gouges, all metal floor chisels for the use of plumbers, electricians, &c., and cape chisels. To facilitate the selection of sweeps of paring gouges for pattern makers' use a page is devoted to illustrating approximate sweeps of all sizes usually kept in stock.

Autoloading Solid Breech Hammerless Repeating Shot Guns.

The Remington Arms Company, Ilion, N. Y., represented by the M. Hartley Company, 313-315 Broadway, New York, is manufacturing a line of autoloading, solid breech, hammerless, repeating shotguns in six field and trap grades and a short barreled riot grade. The word autoloading in this connection signifies only that every time the trigger is pulled the piece loads itself. This gun in standard grade is according to the following specifications: Gauge, 12; barrels, 28 inches long; weight, 7¾ pounds; 2½-inch drop, 14 and 14⅜ inch stock, 5 shots, take down, Remington steel barrels, walnut stock, pistol grip and matted receiver, listing $40. The other grades listed higher are special, $50; trap, $50; tournament, $70; expert, $100; premier, $150, and a riot gun, $40. The sportsman must aim the gun and pull the trigger for each shot, but a new load is thrown into the breech with each pull of the trigger to the limit of five shots.

Capito Mouse and Rat Traps.

Glaser & Hoffman, Philadelphia, Pa., report large sales during the past year of the Capito mouse and rat traps, which they are importing, with several other specialties. These traps are said to be widely used abroad and are becoming pretty well known in this country. They are automatic in action, the rodent entering causing a trap door to close so that there is no escape backward. Its only course is to run forward up a wire covered passage to a balanced bridge. Once on the bridge the animal by its own weight is thrown into a tank of water. The movement of the bridge at the same time reopens the door, thus resetting the trap.

Ice Water Jars.

Cordley & Hayes, 172 Duane street, New York, sole agents for Fibrotta indurated fiber ware, have put on the market a new line of fiber ice water jars. They are made in nine sizes, holding from 3 to 21 gallons, those to 9 gallons, inclusive, having one of their patented nickeled self closing push faucets, while the 11, 15 and 21 gallon sizes have two of the same style faucets. These jars or coolers, in which ice is placed in the water to be cooled, are made in mahogany finish, there also being a decorated style in three colors—red, rose leaf green and pure white. The latter group are gold striped. Both jars have covers of the same material. The sizes in each finish range from 9 to 16 inches diameter and inside depth of 11 to 24 inches.

Solid Corundum Wheels.

Star Corundum Wheel Company, Detroit, Mich., is now manufacturing many of its wheels of solid corundum. This has been made possible during the last two years by corundum being obtainable in large enough quantities to admit of its exclusive use in the manufacture of wheels. The company states that solid corundum wheels are at least 50 per cent. more efficient than emery wheels, and while the first cost is greater they are much cheaper in the end, because a greater amount of work can be done with them and done more rapidly. The company is also using corundum in the construction of oil stones and specialties.

Flexite Paint.

The Standard Paint Company, 100 William street, New York, is giving special attention to what it calls Flexite, a metal preservative paint. It is designed for covering all kinds of iron, steel and metal work, and is furnished in five colors. The priming coat is a cream color, then come black, red, olive and green. It is a linseed oil paint, double boiled and the colors are full of life, and are said to retain their brilliancy for three years, regardless of atmospheric condition. Specimen sheets of steel have been subjected to many severe tests, the coating in all cases re-

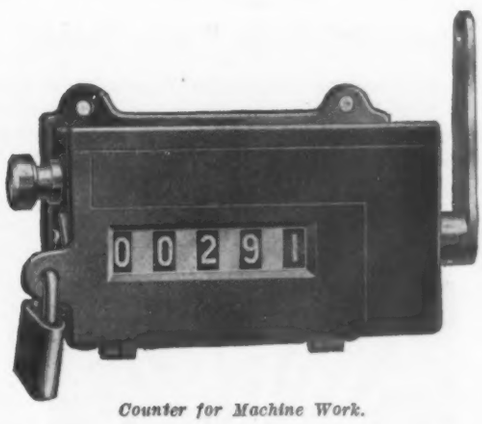
maining sound and firm. Some were subjected to the action of strong sulphuric acid fumes, some to sulphurous acid fumes and others to carbon-di-oxide, which, we are told, had no effect on the paint, which was also true regarding exposure to hydrogen sulphite fumes. The specimens were also submerged in 5 per cent. solutions of sulphuric acid, hydrochloric acid and nitric acid, respectively, for 12 hours, the only noticeable effect after each test being a slight darkening of the color. Other tests referred to by the company were suspension in ice water for an hour and then immediate immersion in boiling water, neither of which tests caused the paint to crack, although the films were somewhat softened and colors slightly dulled. When subjected to stack temperature (600 to 700 degrees F.) some tendency to blister was noticed, together with a slight darkening of color, but without other ill effects. This paint is especially recommended for structural iron, metal bridges, street cars, car trucks, train sheds, marine works, metal roofs, iron fences, steel smoke stacks, boiler fronts, ornamental iron work and similar surfaces.

Chain of Locks Operated by One Key.

The Eagle Lock Company, Terryville, Conn., and 105 Chambers street, New York, has recently begun the manufacture of a high grade cylinder night latch, which, although not a new article in the trade, is new to the company. As a line of cylinder door locks has been made some time, it is now in the unique position of being able to furnish approximately all the kinds of locks an average person has use for. If so ordered, it is now possible to set up the various kinds, to which additions can be made as occasion requires, so that a chain of locks for multifarious purposes can be operated with one small, thin, flat key, instead of the individual being compelled to carry a bunch of keys. For example, the system may include innumerable uses of not only door locks and latches, but trunk, wardrobe, drawer, desk, chest and pad locks, installed either at home, business address, club, or other place where security is obtained by the use of lock and key. The night latch here referred to is made in black japan finish, antique copper and solid bronze, each having 3 keys regularly.

Counter for Machine Work.

Recording Fare Register Company, New Haven, Conn., is making a line of counting machines for various purposes. Three styles are listed: No. 0, a hand tally register, which can be operated in the pocket; No. 1, especially adapted for tallying merchandise, fruit, &c., and No. 3, here illustrated, which is a counter for machine work. The style last mentioned is 6 inches long, 3



Counter for Machine Work.

inches high and 2¼ inches deep. The figures are 5-16 inch long. It is furnished with an enameled iron or brass case and padlock complete, ready to attach to machinery or wall. The padlock makes it impossible for any one to reset or tamper with the machine, without the consent of the man having the key. The device registers to 100,000 and then resets automatically to zero, or it can be reset at any time, if desired.

Cog Gear or Ratchet Pump Handle.

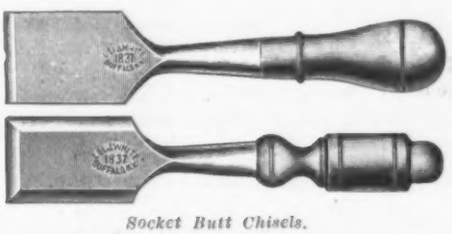
F. E. Myers & Bro., Ashland, Ohio, are offering cog gear or ratchet handles in connection with a number of their pumps. The handle shown in the accompanying cut is applied to the branch pipe double acting force pump. This style of handle is guaranteed by the makers to operate from 25 to 40 per cent. easier than the old lever fulcrum constructions. The ratchet handle secures a 6-inch stroke with a 3-inch fulcrum while, it is explained, with the old construction a 5½-inch fulcrum is

Cog Gear or Ratchet Handle Applied to Branch Pipe Double Acting Force Pump.

necessary on a 6-inch stroke, showing by actual figures a difference of 40 per cent. in the power required to operate the piston rod. It is pointed out that in actual practice this difference is even greater, since the piston rod which is held in position by a roller bearing opposite the handle, moves perpendicularly and without a side motion, reducing the friction to a minimum. The pump can be furnished with threeway discharge and windmill head.

Socket Butt Chisels.

L. & I. J. White Company, Buffalo, N. Y., New York office 45 Centre street, has just added to its line of carpenters' tools the socket butt chisels shown herewith.



Socket Butt Chisels.

They are made in plain and bevel edge, in all sizes from ⅛ to 2 inches, and are alluded to as high grade tools in every particular.

Dunlap's Silver Blade Cream and Egg Whip.

J. S. Dunlap, 39-45 West Randolph street, Chicago, makes the cream and egg whip shown in the accompanying cut. He states that in the No. 2 size, which is recommended for a pint or more of cream, the perforated blade of flexible silver contains more than a yard of cutting edge when in motion, and that it cuts rather than

Dunlap's Silver Blade Cream and Egg Whip.

beats the cream, without spattering it or tiring the muscles. It is further stated that ½ pint of ordinary cream can be perfectly whipped in less than one minute, if cream and bowl are cold. When the whipping is finished the whipped cream, &c., is instantly slipped off the blade by a sudden movement over the bowl, a few seconds sufficing for washing the whip.

Flour Bin Truck.

St. Louis Hardware Mfg. Company, 1514-1516 O'Fallon street, St. Louis, Mo., is offering the flour bin truck shown in the accompanying cuts, which represent it separately and in use. It is made of steel, the four arms be-

Flour Bin Truck.

ing loosely fastened to a square center plate, so as to be adjustable for diameters from 8 inches when closed to 15½ inches when opened. The outer ends of the arms are provided with casters. The truck can obviously be used for moving other articles than flour bins.

The Bruley Steel Fence Post.

Shadbolt & Boyd Iron Company, Milwaukee, Wis., is offering the steel fence post illustrated in the accompanying cuts. In Fig. 1 are shown posts used with woven wire fencing, plain or barb wire. Posts are notched to fit any style of woven or wire fence, and are 4 feet or more above the ground, as may be required. They are made of Bessemer steel, ⅝ x 1⅜ inches. The base is of wrought iron tubing 18 x 24 inches long, with one end pointed. In Fig. 2 an iron brace 3 x 12 inches in size is shown. This is only necessary for use in soft or wet ground. The weight of a post complete is 10 pounds and upward, according to the length required. The base is first driven into the ground, 6 to 12 inches of the post inserted in it, and a handful of cement thrown in to fill up the top of the base and to keep water out. The cap, shown in Fig. 2, is used to fit over the base while driving into the ground. In the standard post diagonal notches are cut 4 inches apart for ordinary wire fencing. After placing the wiring in the notches a slight tap of

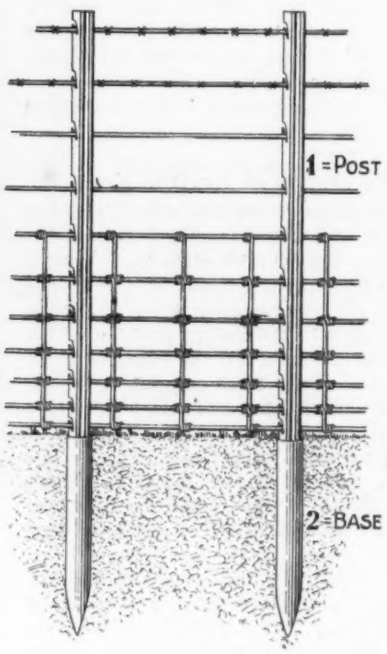


Fig. 1.—The Bruley Steel Fence Post.

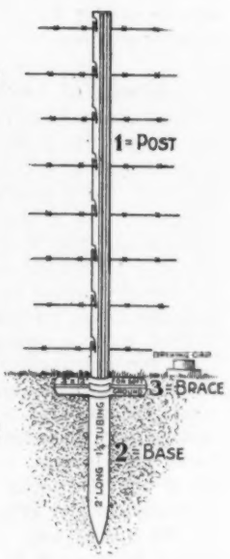


Fig. 2.—The Bruley Steel Fence Post with Brace.

the hammer on the notch will hold the wiring rigid. Posts are furnished, at a small additional cost, with ornamented tops for lawns, parks, cemeteries, &c. Posts and bases can be furnished of any length. The main feature of the device is that the tube or base and the post are separate, which is referred to as making the post absolutely rigid. Another advantage is the elimination of post hole digging.

Rogers Belt Punch Display Stand.

The accompanying illustration represents a display stand, 11 x 15 inches in size, which the Sattley Stacker Company, Indianapolis, Ind., is sending out to retail dealers to assist in the sale of the Rogers belt punch. The

Rogers Belt Punch Display Stand.

stand is very neat and attractive in appearance and calls attention to the goods shown in an effective manner and will doubtless be appreciated by the trade. The company

furnishes one of these display stands free of charge with each dozen belt punches shipped to the merchant.

White Rose and White Daisy Washers.

The accompanying illustrations represent two additions to the line of the White Lily Washer Company, Davenport, Iowa. The feature of the White Rose washer, Fig. 1, is its bicycle ball bearings, said to be of the finest grade, which are used in every bearing and which run in ball races turned from the best grade of Bessemer tool steel. By the use of these fine bearings a high speed rotary is produced, creating suds freely, and the power

White Rose Washing Machine.

necessary to run the machine is reduced to the minimum. The tub is made from a selected grade of Mississippi and Louisiana red cypress, filled and varnished in a natural finish and bound with heavy galvanized hoops, making it very durable. The hinges are put on with bolts, and every part is reinforced wherever necessary. The iron and steel parts of this machine are all taken from selected stock, and the whole is guaranteed to be free from imperfections in material or workmanship. The White Daisy machine, Fig. 2, has a corrugated tub made of Louisiana red cypress, so that the clothes are rubbed not only on the top and bottom, but also on the sides. It

White Daisy Washing Machine.

also has double ball bearings at both top and bottom, the two points of contact insuring perfect alignment and making the machine revolve with the greatest ease. The cover is hinged to the tub; thus, when through washing it is unnecessary to take it off and lay it down, getting water and suds all over the floor. When the cover is lifted the water runs back into the tub. The frame is well made and supported by four iron braces running diagonally across it. The wringer board is a special feature, being a continuation of the frame and fitted with a sliding drip board, so that the wringer can be attached to the machine all the time, saving the trouble of removing it at every washing.

PAINTS, OILS AND COLORS

Animal, Fish and Vegetable Oils—

	₱ gal
Linseed, City, raw	42 @43
Linseed, City, Boiled	43 @44
Linseed, State and West'n, raw	39 @40
Linseed, raw Calcutta seed	@65
Lard, Extra Prime, Winter	71 @72
Lard, Extra No. 1	51 @52
Lard, No. 1	41 @43
Cotton-seed, Crude, f.o.b. mills	@..
Cotton-seed, Summer Yellow, Prime	37½@39
Cotton-seed, Summer Yellow, off grades	36½@37
Sperm, Crude	55 @..
Sperm, Natural Spring	@..
Sperm, Bleached Spring	@..
Sperm, Natural Winter	63 @65
Sperm, Bleached Winter	66 @67
Tallow, Prime	51 @53
Whale, Crude	31 @32
Whale, Natural Winter	38 @41
Whale, Bleached Winter	40 @42
Extra Bleached Winter	44 @46
Menhaden, Brown, Strained	26 @29
Menhaden, Light, Strained	27 @30
Menhaden, Bleached, Winter	@..
Menhaden, Ex-Bld., Winter	@..
Menhaden, Southern	@..

	₱ lb
Cocoanut, Ceylon	6¾@ 7
Cocoanut, Cochin	8 @ 8¼
Cod, Domestic, Prime	30 @31
Cod, Newfoundland	35 @37
Red, Elaine	38 @41
Red, Saponified	4¾@ 5
Olive, Italian, bbls	57 @60
Neatsfoot, prime	48 @49
Palm, Logos	6 @ 6¼

Mineral Oils—

	₱ gal. test
Black, 29 gravity, 25@30 cold	10¼@11½
Black, 29 gravity, 15 cold test	11¼@12½
Black, Summer	10½@11¾
Cylinder, light filtered	18 @19
Cylinder, dark filtered	16 @17
Paraffine, 903-907 gravity	13¼@14
Paraffine, 903 gravity	12½@13
Paraffine, 883 gravity	10¼@10¾
Paraffine, Red	12¼@14

In small lots ½¢ advance.

Miscellaneous—

	₱
Barytes:	
White, Foreign	₱ ton $17.50@19.00
Amer. floated	₱ ton 19.00@21.00
Off color, No. 2	₱ ton 13.50@15.00
Chalk, in bulk	₱ ton 3.00@ 3.25
Chalk, in bbls	₱ 100 lb .@ .35
China Clay, English	₱ ton 12.00@17.00
Cobalt, Oxide	₱ 100 lb 2.50@ 2.60
Whiting, Common	₱ 100 lb .43@ .48
Whiting, Gilders	₱ 100 lb .50@ .55
Whiting, Ex. Gilders	₱ 100 lb .55@ .60

Putty, Commercial—₱ 100 lb

In bladders	$1.70 @1.85
In bbls. or tubs	1.20 @1.40
In 1 lb to 5 lb cans	2.65 @2.95
In 12½ to 50 lb cans	1.50 @1.90

Spirits Turpentine—₱ gal.

In Oil bbls	67½@68
In machine bbls	66 @68½

Glue—

	₱ lb
Cabinet	11 @15
Common Bone	7 @ 9
Extra White	18 @24
Foot Stock, White	11 @14
Foot Stock, Brown	8 @11
German Hide	12 @18
French	10 @40
Irish	13 @16
Low Grade	9 @12
Medium White	14 @17

Gum Shellac—

	₱ lb
Bleached Commercial	39 @41
Bone Dried	49 @51
Button	40 @..
Diamond I	53 @54
Fine Orange	46 @50
A. C. Garnet	39 @40
D. C	@56
Octagon B	@52
T. N	42 @43
V. S. O	53 @54

Colors in Oil—

	₱ lb
Black, Lampblack	12 @14
Blue, Chinese	36 @46
Blue, Prussian	32 @36
Blue, Ultramarine	13 @16
Brown, Vandyke	11 @14
Green, Chrome	12 @16
Green, Paris	@24
Sienna, Raw	12 @15
Sienna, Burnt	12 @15
Umber, Raw	11 @14
Umber, Burnt	11 @14

White Lead, Zinc, &c.—

	₱ lb
Lead, English white, in Oil	9½@ 9¾
Lead, American white, in Oil:	
Lots of 500 lb or over	@ 7¼
Lots less than 500 lb	@ 7¾
In Barrels	@ 6¾
Lead, White, in oil, 25 lb tin pails, add to keg price	@ ½
Lead, White, in oil, 12½ lb tin pails, add to keg price	@ 1
Lead, White, in oil, 1 to 5 lb ass'ted tins, add to keg price	@ 1¼

Lead, American. Terms: For lots 12 tons and over ¼¢ rebate; and 2% for cash if paid in 15 days from date of invoice; for lots of 500 lbs. and over 2% for cash if paid in 15 days from date of invoice, for lots of less than 500 lbs. net.

	₱ lb
Lead, White, Dry, in bbls	@ 6¾
Zinc, American, dry	4¾@ 5
Zinc, French:	
Antwerp, Red Seal, dry	8¾
Antwerp, Green Seal, dry	9¾
Paris, Red Seal, dry	9¼
Paris, Green Seal, dry	10½
Zinc, V. M. French, in Poppy Oil:	
Green Seal:	
Lots of 1 ton and over	12⅝@13¼
Lots of less than 1 ton	12⅝@13⅝
Zinc, V. M. French, in Poppy Oil:	
Red Seal:	
Lots of 1 ton and over	11¾@11⅞
Lots of less than 1 ton	11¾@12¼

Discounts.—French Zinc.—Discounts to buyers of 10 bbl. lots of one or mixed grades 1%; 25 bbls., 2%; 50 bbls., 4%.

Dry Colors—

	₱ lb
Black, Carbon	5 @10
Black Drop, American	4 @ 6
Black, Drop, English	5 @15
Black, Ivory	16 @20
Lamp, Com	4½@ 6
Blue, Celestial	4 @ 6
Blue, Chinese	29 @32
Blue, Prussian	27 @30
Blue, Ultramarine	4½@15
Brown, Spanish	½@ 1
Carmine, No. 40	$3.30@3.40
Green, Chrome, ordinary	3½@ 6
Green, Chrome, pure	17 @25
Lead, Red, bbls., ½ bbls. and kegs:	
Lots 500 lb or over	@ 7¼
Lots less than 500 lb	@ 7¾
Litharge, American, bbls	@ 7¼
Ocher, American	₱ ton $8.50@16.00
Ocher, American Golden	2½@ 3½
Ocher, French	1¾@ 2½
Ocher, Foreign Golden	3 @ 4
Orange Mineral, English	10 @12
Orange Mineral, French	10¾@12
Orange, Mineral, German	8½@10
Orange, Mineral, American	8½@ 8½
Red, Indian, English	4½@ 8½
Red, Indian, American	3 @ 3¼
Red, Turkey, English	4 @10
Red, Tuscan, English	7 @10
Red, Venetian, Amer.	₱ 100 lb $0.50@1.25
Red Venetian, English	100 lb $1.15@1.75
Sienna, Italian, Burnt and Powdered	3 @ 9½
Sienna, Ital., Raw, Powd	3 @ 6½
Sienna, American, Raw	1½@ 2
Sienna, American, Burnt and Powdered	1½@ 2
Talc, French	₱ ton $15.00@30.00
Talc, American	₱ ton 15.00@25.00
Terra Alba, French	₱ 100 lb 90 @1.00
Terra Alba, English	₱ 100 lb 90 @1.00
Terra Alba, American, ₱ 100 lb, No. 1	70 @80
Terra Alba, American, ₱ 100 lb, No. 2	60 @65
Umber, T'key, Bnt. & Pow	2½@ 3½
Umber, Turkey, Raw & Pow	2½@ 3½
Umber, Burnt, Amer	1¼@ 2
Umber, Raw, Amer	1¼@ 2
Yellow Chrome	12 @14
Vermilion, American Lead	10 @25
Vermilion, Quicksilver, bulk	@65
Vermilion, Quicksilver, bags	@65
Vermilion, English, Import	75 @80
Vermilion, Chinese	$0.90@1.00

Current Hardware Prices.

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer—are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus 33⅓ @ 33⅓ & 10% signifies that the price of the goods in question ranges from 33⅓ per cent. discount to 33⅓ and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued May, 1905, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—A new edition of "Standard Hardware Lists" has been issued and contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters, Blind—

Domestic, ℔ doz. $3.00.....33⅓%
North's 10%
Zimmerman's—See Fasteners, Blind.

Window Stop—

Ives' Patent.....35%
Taplin's Perfection.....35%

Ammunition—

See *Caps, Cartridges, Shells, &c.*

Anvils—American—

Eagle Anvils.....℔ lb 6¾@7 ¢
Hay-Budden, Wrought.....9@9¼ ¢
Horseshoe brand, Wrought.....9@9¼ ¢
Trenton .....℔ lb 9@9¼ ¢

Imported—

Peter Wright & Sons.....℔ lb 10¼ ¢

Anvil, Vise and Drill—

Millers Falls Co., $18.00.....15&10%

Apple Parers—

See *Parers, Apple, &c.*

Aprons, Blacksmiths'—

Livingston Nail Co.....33⅓%

Augers and Bits—

Com. Double Spur.....75@75&5%
Jennings' Pats., reg. finish.....50&10@50%
Black Lip or Blued.....60&10%
Boring Mach. Augers.....70&10%
Car Bits, 12-in. twist.....50&10%
Ford's Auger and Car Bits.....40&5%
Forstner Pat. Auger Bits.....25%
C. E. Jennings & Co.:
No. 10 ext. lip. R. Jennings' list..25%
No. 30, R. Jennings' list.....40&7½%
Russell Jennings'.....25&10&2½%
L'Hommedieu Car Bits.....15%
Mayhew's Countersink Bits.....45%
Millers Falls.....50&10&7½%
Ohio Tool Co.'s Bailey Auger and Car Bits.....40&10%
Pugh's Black.....20%
Pugh's Jennings' Pattern.....35%
Snell's Auger Bits.....60%
Snell's Bell Hangers' Bits.....60%
Snell's Car Bits, 12-in. twist.....60&10%
Wright's Jennings' Bits.....50%

Bit Stock Drills—

See *Drills, Twist.*

Expansive Bits—

Clark's small, $18; large, $26....50&10%
Clark's Pattern, No. 1, ℔ doz. $26; No. 2, $18.....65%
Ford's, Clark's Pattern.....60&5%
C. E. Jennings & Co., Steer's Pat..25%
Swan's 60%

Gimlet Bits—

Per gro.
Common Dble. Cut....$3.00@3.25
German Pattern, Nos. 1 to 10, $4.60; 11 to 13, $5.75

Hollow Augers—

Bonney Pat., per doz..$5.50@6.00
Ames .....25&10%
Universal 20%
Wood's Universal.....25%

Ship Augers and Bits—

Ship Augers.....45&5@—%
Ford's .....33⅓&5%
C. E. Jennings & Co.:
L'Hommedieu's 15%
Watrous' .....35&5%
Ohio Tool Co.'s.....40%
Snell's 40%

Awl Hafts—

See *Handles, Mechanics' Tool.*

Awls—

Brad Awls:
Handled .....gro. $2.75@3.00
Unhdld, Shldered..gro.63@66 ¢
Unhandled, Patent..gro.66@70 ¢
Peg Awls:
Unhandled, Patent..gro. 31@34 ¢
Unhdld, Shldered..gro. 65@70 ¢
Scratch Awls:
Handled, Com...gro. $2.50@4.00
Handled, Socket..gro.$11.50@12.00
Hurwood 40%

Awl and Tool Sets—

See *Sets, Awl and Tool.*

Axes—

Single Bit, base weights:
First Quality.....$4.75@5.00
Second Quality.....$4.25@4.50
Double Bit, base weights:
First Quality.....$7.00@7.50
Second Quality.....$6.50@6.75

Axle Grease—

See *Grease, Axle*

Axles—

Iron or Steel
Concord, Loose Collar...4¼@4¾ ¢
Concord, Solid Collar...4¾@5¼ ¢
No. 1 Common, Loose...3¼@3¾ ¢
No. 1½ Com., New Style3¾@4¼ ¢
No. 2 Solid Collar.....4@4½ ¢
Half Patent:
Nos. 7, 8, 11 and 12....75@75&5%
Nos. 13 to 14.....70&10@75&5%
Nos. 15 to 18...75&10@75&10&5%
Nos. 19 to 22...75&10@75&10&5%

Boxes, Axle—

Common and Concord, not turned lb..4½@5 ¢
Common and Concord, turned. lb., 5½@6 ¢
Half Patent.....lb. 8½@9 ¢

Bait—Fishing—

Hendryx:
A Bait.....20%
B Bait.....25%
Competitor Bait.....20&5%

Balances—Sash—

Caldwell new list.....50%
Pullman .....50&10@60%

Spring—

Spring Balances.....50&10@60%
Chatillon's:
Light Spg. Balances.....40&10%
Straight Balances.....40%
Circular Balances.....50%
Large Dial.....30%

Barb Wire—

See *Wire, Barb.*

Bars—Crow—

Steel Crowbars, 10 to 40 lb.... per lb., 3¼ ¢

Towel—

No. 10 Ideal, Nickel Plate..℔ gro. $8.50

Beams, Scale—

Scale Beams.....40&10@50%
Chattillon's No. 1.....30%
Chattillon's No. 2.....40%

Beaters, Carpet—

Holt-Lyon Co.:
No. 12 Wire Coppered ℔ doz. $0.85; Tinned $1.00
No. 11 Wire Coppered ℔ doz. $1.10; Tinned $1.20
No. 10 Wire Galvanized..℔ doz. $1.75
Western W. G. Co.:
No. 1 Electric.....℔ gro. $7.80
No. 2 Buffalo.....℔ gro. $9.00
No. 3 Perfection Dust.....℔ gro. $8.00

Egg—

Holt-Lyon Co.:
Holt, No. A, Japanned....℔ doz. $1.20
Holt, No. 1, Tinned....℔ doz. $1.50
Holt, No. B, Japanned....℔ doz. $2.00
Holt, No. 2, Tinned....℔ doz. $2.25
Lyon, No. 2, Japanned....℔ doz. $1.25
Lyon, No. 3, Japanned....℔ doz. $1.50
Taplin Mfg. Co.: ℔ gro.
No. 60 Improved Dover.....$6.00
No. 75 Improved Dover.....$6.50
No. 100 Improved Dover.....$7.00
No. 102 Improved Dover, Tin'd..$8.50
No. 150 Improved Dover, Hotel..$15.00
No. 152 Imp'd Dover, Hotel, T'd.$17.00
No. 200 Imp'd Dover Tumbler....$8.50
No. 202 Imp'd Dover Tumbler, T'd.$9.50
No. 300 Imp'd Dover Mammoth, ℔ doz. $25.00
Western, W. G. Co., Buffalo.....$7.00
Wonder (R. M. Co.)..℔ gro. net, $6.00

Bellows—

Blacksmith, Standard List.. 60&10@70&10%

Hand—

Inch..	*6*	*7*	*8*	*9*	*10*
Doz...	*$4.75*	*5.70*	*6.65*	*7.60*	*8.85*

Molders—

Inch..	*9*	*10*	*11*	*12*	*14*
Doz...	*$8.00*	*9.00*	*10.50*	*12.50*	*14.50*

Net Prices.

Bells—Cow—

Ordinary goods...75&5@75&10&5%
High grade.....70&10@70&10&5%
Jersey .....75&10%
Texas Star.....50%

Door—

Abbe's Gong.....45%
Burton Gong.....50%
Home, R. & E. Mfg. Co.'s.....55&10%
Lever and Pull, Sargent's....60&10&10%
Trip Gong.....50&10@50&10&5%
Yankee Gong.....55%

Hand—

Hand Bells, Polished Brass.60&10%
White Metal.....60%
Nickel Plated.....50&10&60%
Swiss .....60@60&7½%
Cone's Globe Hand Bells.....33⅓@35%
Silver Chime.....33⅓@35%

Miscellaneous—

Farm Bells.....lb. 2¼ ¢
Steel Alloy Church and School 50&10@60%
American Tube & Stamping Co. Gongs 75%
Table Call Bells.....50@50&10%

Belting—Leather—

Extra Heavy, Short Lap..60&5%
Regular Short Lap....60&10&5%
Standard 70%
Light Standard.....70&5%
Cut Leather Lacing.....50%
Leather Lacing Sides, per sq. ft. 25¢

Rubber—

Agricultural (Low Grade).... 75@75&5%
Common Standard....70@70&10%
Standard .....60&5@60&10%
Extra .....60@60&5%
High Grade.....50&5@50&10%

Bench Stops—

See *Stops, Bench*

Benders and Upsetters, Tire—

Detroit Perfected Tire Bender.....40%
Detroit Stoddard's Lightning Tire Upsetters, No. 1, $1.25; No. 2, $7.25; No. 3, $10.50; No. 4, $16.25; No. 5, $20.50.
Green River Tire Benders and Upsetters 20%

Bicycle Goods—

John S. Leng's Son's 1902 list:
Chain 50%
Parts 50%
Spokes 50%
Tubes 60%

Bits—

Auger, Gimlet, Bit Stock Drills, &c.—See *Augers and Bits.*

Blocks—Tackle—

Common Wooden....70&10@75%
Hartz St. Tackle Blocks.....50@50&5%
B. & L. B. Co.:
Boston Wood Snatch, 50%; Eclipse Steel, 75%; Hollow Steel, 50&10%; Star Wire Rope, 50%; Tarbox Metal Snatch, 50%; Tarbox New Style Steel, 50&10%; Wire Rope Snatch, 50%.
Lane's Patent Automatic Lock and Junior 30%
Stowell's Novelty, Mal. Iron....50&10%
Stowell's Self Loading.....60%
See also Machines, Hoisting.

Boards, Stove—

Zinc, Crystal, &c.....40%
Paper Embossed.....40&10%

Boards, Wash—

See *Washboards.*

Bobs, Plumb—

Keuffel & Esser Co.....33⅓%

Bolts—

Carriage, Machine, &c.—

Common Carriage (cut thread): ⅜ x 6 and smaller.....75@—%
Larger and Longer..65&5@—%
Phila. Eagle $3.00 list May 21, '99 80%
Bolt Ends, list Feb. 14, '95.... 65&10@—%
Machine, ⅜ x 4 and smaller 75@—%
Machine, larger and longer.. 65&5@—%

Door and Shutter—

Cast Iron Barrel, Japanned, Round Brass Knob:

Inch.....	*3*	*4*	*5*	*6*	*8*
Per doz..	*$0.30*	*.35*	*.45*	*.60*	*.80*

Cast Iron Spring Foot, Jap'd:

Inch.....	*6*	*8*	*10*
Per doz.....	*$1.20*	*1.50*	*2.25*

Cast Iron Chain, Flat, Japanned:

Inch.....	*6*	*8*	*10*
Per doz.....	*$1.00*	*1.40*	*1.65*

Cast Iron Flat Shutter, Jap'd., Brass Knobs:

Inch.....	*6*	*8*	*10*
Per doz.....	*$0.75*	*.95*	*1.25*

Wrt Barrel Japd.....80@80&10%
Wrt " Bronzed....50@50&10%
Wrt. Spring...70&10@70&10&10%
Wrt. Shutter.....50&5@50&10&5%
Wrt. Square Neck.....75@75&10%
Wrt Square 66⅔&10@66⅔&10&10%
Ives' Patent Door.....60%

Plow and Stove—

Plow .....65&10@—%
Stove .....87½&10@—%

Tire—

Norway Iron.....80%
Norway Iron.....80%
American Screw Company:
Norway Phila., list Oct. 16, '84..80%
Eagle Phila., list Oct. 16, '84....82½%
Bay State, list Dec. 28, '99.....80%
Franklin Moore Co.:
Norway Phila., list Oct. 16, '84...80%
Eagle Phila., list Oct. 16, '84....82½%
Eclipse, list Dec. 28, '99.....80%
Mount Carmel Bolt Co.:
Norway Phila., list Oct. 16, '84...80%
Eagle Phila., list Oct. 16, '84....82½%
Mount Carmel, list Dec. 28, '99...80%
Russell, Burdsall & Ward Bolt & Nut Co.:
Empire, list Dec. 28, '99.....80%
Norway Phila., list Oct., '84.....80%
Upson Nut Co.:
Tire Bolts.....72½%

Borers, Tap—

Borers Tap, Ring, with Handle:

Inch.....	*1¼*	*1½*	*1¾*	*2*
Per doz...	*$4.80*	*5.60*	*6.40*	*8.00*
Inch			*2¼*	*2½*
Per doz.....			*$5.65*	*11.50*

Enterprise Mfg. Co., No. 1, $1.25; No. 2, $1.65@$1.75; No. 3, $2.50 each....25%

Boxes, Mitre—

C. E. Jennings & Co.....30%
Langdon .....15&10%
Perfection 40%
Seavey 33⅓%
Stanley R. & L. Co.:
Nos. 240 to 460.....30%
Nos. 50 and 60.....35%

Braces—

Common Ball American..$1.25@1.30
Barber's .....50&10&10@60&10%
Fray's Genuine Spofford's.....60%
Fray's No. 70 to 120, 81 to 123, 207 to 414 .....60%
C. E. Jennings & Co.....50&5%
Mayhew's Ratchet.....60%
Mayhew's Quick Action Hay Pat...50%
Millers Falls Drill Braces.....25&10%
P., S. & W. Co., Peck's Pat.60@60&5%
Stanley R. & L. Co.:
Stanley 35%
Victor 45%

Brackets—

Wrought Steel...80&10@80&10&5%
Griffin's Pressed Steel.....80@80&10%
Griffin's Folding Brackets.....70&10%
Stowell's Cast Shelf.....75%
Stowell's Sink.....50%
Western, W. G. Co., Wire.....60&10%

Bright Wire Goods—

See *Wire and Wire Goods.*

Broilers—

Kilbourne Mfg. Co.....75&20%
Western, W. G. Co.....80%
Wire Goods Co.....75@75&10%

Buckets, Galvanized—

Price per dozen.

Quart.....	*10*	*12*	*14*
Water, Regular...	*1.40*	*1.70*	*1.90*
Water, Heavy....	*3.40*	*3.70*	*3.80*
Fire, Rd. Bottom..	*2.30*	*2.55*	*2.95*
Well	*2.55*	*2.87*	*3.15*

Bucks, Saw—

Hoosier.....℔ gro. $36.00

Bull Rings—

See *Rings, Bull*

Butts—Brass—

Wrought, list, Sept., '96..15@—%
Cast Brass, Tiebout's.....50%

Cast Iron—

Fast Joint, Broad....40&10@50%
Fast Joint, Narrow...40&10@50%
Loose Joint.....70&10@75%
Loose Pin.....70&10@75%
Mayer's Hinges.....70@70&5
Parliament Butts.....70@70&5

Wrought Steel—

	Discount.	
Reversible and Broad	*75&5%*	*Extra, 10&10@*
Light Reversible, Light Narrow	*75&10%*	
Loose Joint, Narrow, L't Inside Blind, etc.	*75%*	
Back Flaps, Table, Chest.	*70&10%*	

Cages, Bird—

Hendryx, Brass:
3000, 5000, 1100 series.....5%
1200 series.....33⅓%
200, 300, 600 and 900 series.....40&10%
Hendryx Bronze:
700, 800 series.....40&10%
Hendryx Enameled.....40&10%

Calipers—

See *Compasses.*

Calks, Toe and Heel—

Blunt, 1 prong.....per lb. 4¼@4¼ ¢
Sharp, 1 prong...per lb., 4¼@4¾ ¢
Burke's Blunt.....4@4¼ ¢
Burke's Sharp.....4¼@4¾ ¢

Gautier, Blunt.....4@4¼¢
Gautier, Sharp.....4½@4¾¢
Perkins', Blunt Toe.....₱ lb 3.65¢
Perkins', Sharp Toe.....₱ lb 4.15¢

Can Openers—
See *Openers, Can.*

Cans, Milk—

	5	8	10 gal.
Illinois Pattern	$1.35	1.85	2.05 each.
New York Pattern	1.50	2.20	2.45 each.
Baltimore Pattern	1.50	2.20	2.45 each.
Dubuque	1.35	1.60	1.75 each.

Cans, Oil—

Buffalo Family Oil Cans:		
3	5	10 gal.
$18.00	60.00	129.60 gro., net.

Caps, Percussion—
Eley's E. B.....52@55¢
G. D.....per M 34@35¢
F. L.....per M 40@42¢
G. E.....per M 48@50¢
Musket.....per M 62@63¢

Primers—
Berdan Primers, $2 per M...20%
B. L. Caps (Sturtevant Shells) $2 per M.....20%
All other primers per M.$1.52@1.60

Cartridges—
Blank Cartridges:
32 C. F., $5.50.....10&5%
38 C. F., $7.00.....10&5%
22 cal. Rim, $1.50.....10&5%
32 cal. Rim, $2.75.....10&5%
B. B. Caps, Con. Ball, Swgd..$1.90
B. B. Caps, Round Ball....$1.40
Central Fire.....25%
Target and Sporting Rifle..15&5%
Primed Shells and Bullets.15&10%
Rim Fire, Sporting.....50%
Rim Fire, Military.....15&5%

Casters—
Bed.....70@70&10%
Plate.....60&10@60&10&5%
Philadelphia.....75@75&10%
Acme, Ball Bearing.....33⅓%
Boss.....70&10%
Boss Anti-Friction.....70&10%
Gem (Roller Bearing).....80%
Martin's Patent (Phoenix).....45%
Standard Ball Bearing.....45%
Tucker's Patent low list.....30%
Yale (Double Wheel) low list.....50%

Cattle Leaders—
See *Leaders, Cattle.*

Chain, Coil—
American Coil, Straight Link:

5-16	¼	5-16	⅜	7-16	½	9-16
$3.70	3.90	4.95	4.20	4.05	3.95	3.90
⅝	¾	⅞ to 1		1⅛ to 1¼ inch.		
$3.85	3.70	3.65		3.80		

German Coil.....60&10&10@70%

Halter—
Halter Chains.....60&5@60&10%
German Pattern Halter Chains, list July 24, '97.....60&10&10%
Covert Mfg. Co.
Halter.....35&5%
Covert's Saddlery Works
Halter.....70%

Cow Ties—
See *Halters and Ties.*

Trace, Wagon, &c.—
Traces, Western Standard: 100 pr.
6½—6-3, Str'ght, with ring..$25.00
6½—6-2, Str'ght, with ring..$26.00
6½—8-2, Str'ght, with ring..$30.00
6½—10-2, Str'ght, with ring..$35.00
NOTE.—Add 2c per pair for Hooks. Twist Traces 2c per pair higher than Straight Link.
Eastern Standard Traces, Wagon Chain, &c.....60&10%

Miscellaneous—
Jack Chain, list July 10, '93:
Iron.....60&10&5@70%
Brass.....60&10@60&10&10%
Safety Chain.....75@75&10%
Gal. Pump Chain.....lb. 4@4½¢
Covert Mfg. Co.:
Breast, Halter, Heel, Rein, Stallion.....40%
Covert Sad. Works:
Breast, Hold Back, Rein.....70%
Oneida Community:
Am. Dog Leads and Kennel Chains. 40@40&5%
Niagara Dog Leads and Kennel Chains.....45@60&5%
Wire Goods Co.:
Dog Chain.....70&10%
Universal Dbl.-Jointed Chain.....50%

Chain and Ribbon, Sash—
Oneida Community:
Copper Chain.....60&5%
Steel Chain.....60%
Pullman:
Bronze Chain.....60%
Steel Chain.....60&10%
Sash Chain Attachments, per set..8¢
Aluminoy Sash Ribbon, per 100 ft.....$1.25@$3.00
Sash Ribbon Attachments, per set.8¢

Chalk—(From Jobbers.)
Carpenters' Blue.....gro. 38@40¢
Carpenters' Red.....gro. 33@35¢
Carpenters' White....gro. 28@30¢
See also Crayons.

Checks, Door—
Bardsley's.....45%
Eclipse.....60&10%
Pullman, per gro.....$54.00
Russwin.....40%

Chests, Tool—
American Tool Chest Co.:
Boy's Chests, with Tools.....55%
Youths' Chests, with Tools.....40%
Gentlemen's Chests, with Tools..30%
Farmers', Carpenters', etc., Chests, with Tools.....20%
Machinists' and Pipe Fitters' Chests, Empty.....50%
Tool Cabinets.....50%
C. E. Jennings & Co.'s Machinists' Tool Chests.....33⅓&10%

Chisels—
Socket Framing and Firmer
Standard List...75&10@75&10&5%
Buck Bros.....30%
Charles Buck.....30%
C. E. Jennings & Co. Socket Firmer No. 10.....60%
C. E. Jennings & Co. Socket Framing No. 15.....60%
Ohio Tool Co.'s.....70%
Swan's.....75%
L. & I. J. White.....30@70&5%
L. & I. J. White, Tanged.....25&5%

Tanged—
Tanged Firmers.....33 1-3@40%
Buck Bros.....30%
Charles Buck.....30%
C. E. Jennings & Co. Nos. 191, 181..25%

Cold—
lb.
Cold Chisels, good quality..13@15¢
Cold Chisels, fair quality..11@12¢
Cold Chisels, ordinary... 9@10¢

Chucks—
Almond Drill Chucks.....35%
Almond Turret Six-Tool Chuck....35%
Beach Pat., each $8.00.....35&5%
Empire.....25%
Blacksmiths'.....20%
Jacobs' Drill Chucks.....35%
Pratt's Positive Drive.....25%
Skinner Patent Chucks:
Independent Lathe Chucks....40&10%
Universal, Reversible Jaws.....40%
Combination, Reversible Jaws.....40%
Drill Chucks, New Model.....25%
Drill Chucks, Standard.....40&10%
Drill Chuck, Skinner Pat.....25%
Drill Chucks, Positive Drive.....33⅓%
Planer Chucks.....30%
Face Plate Jaws.....40&10%
Standard Tool Co.:
Improved Drill Chuck.....45%
Union Mfg. Co.:
Combination, Nos. 1, 2, 3, 4, 5, 6, 7, 8 and 17.....40%
Combination, No. 21.....35%
Scroll Combination, Nos. 82 and 84.....30%
Geared Scroll, Nos. 33, 34 and 35..35%
Independent Iron, Nos. 18 and 318.40%
Independent Steel, No. 61.....30%
Union Czar Drill, Nos. 000, 101, 103.....35%
Universal 11, 12, 16, 17, 13, 14, 15..40%
Universal, No. 42.....35%
Iron Face Plate Jaws, Nos. 28, 30, 48 and 50.....40%
Steel Face Plate Jaws, Nos. 70 and 72.....35%
Westcott Patent Chucks:
Lathe Chucks.....50%
Little Giant Auxiliary Drill.....50%
Little Giant Double Grip Drill..50%
Little Giant Drill, Improved.....50%
Oneida Drill.....50%
Scroll Combination Lathe.....50%

Clamps—
Adjustable, Hammers'.....20@20&5%
Cabinet, Sargent's.....50&10%
Carriage Makers', P., S. & W. Co.....40&10@50%
Carriage Makers', Sargent's.....60%
Besly, Parallel.....33⅓&10%
Lineman's, Utica Drop Forge & Tool Co.....40%
Wood Workers, Hammers'.....40&10%
Saw Clamps, see Vises, Saw Filers'.

Cleaners, Drain—
Iwan's Champion, Adjustable.....55%
Iwan's Champion, Stationary.....47%

Sidewalk—
Star Socket, All Steel..₱ doz. $4.05 net
Star Shank, All Steel..₱ doz. $3.24 net
W. & C. Shank, All Steel, ₱ doz., 7½ in., $3.00; 8 in., $3.25.

Cleavers, Butchers'—
Foster Bros.....30%
New Haven Edge Tool Co.'s.....45%
Fayette R. Plumb.....30%
L. & I. J. White.....30%

Clippers, Horse and Sheep—
Chicago Flexible Shaft Company: 30%
'98 Chicago Horse, each....$3.75
1902 Chicago Horse, each..$10.75
20th Century Horse, each..$5.00
Lightning Belt Horse, each.$15.00
Chicago Belt Horse, each.$20.00
Stewart's Enclosed Gear Horse, each.....$6.75
Stewart's Patent Sheep Shearing Machine, each.....$12.75

Clips, Axle—
Regular Styles, list July 1, '05.80%

Cloth and Netting, Wire
—See *Wire, &c.*

Cocks, Brass—
Hardware list:
Compression, Plain Bibbs, Globe, Kerosene, Racking, &c., Cocks.....75@75&5%

Coffee Mills—
See *Mills, Coffee.*

Collars, Dog—
Nickel Chain, Walter B. Stevens & Son's list.....40%
Leather, Walter B. Stevens & Son's list.....40%

Combs, Curry—
Metal Stamping Co.....40%

Mane and Tail—
Covert's Saddlery Works.....60&10%

Compasses, Dividers, &c.
Ordinary Goods.....75&5@75&10%
Bemis & Call Hdw. & Tool Co.:
Dividers.....65%
Calipers, Double.....65%
Calipers, Inside or Outside.....65%
Calipers, Wing.....60%
Compasses.....50%
Wm. Schollhorn Co.:
Excelsior Dividers.....60%
Lodi Dividers.....75%

Conductor Pipe,—
L. C. L. to Dealers:

Territory:	*Galvanized*		
	Galv. Steel.	*Charcoal Iron.*	*Copper.*
Eastern:			
	70&10 %	*60&7½%*	*50%*
Central:			
	70& 2½%	*60 %*	*40&10&5%*
Western and S. W.:			
	65&10 %	*50&10&2½%*	*47½%*

So. Western
62½&7½% 50&5% 40&10%
Copper. 14&16 oz.
Eastern.....50&10%
Central.....50&7½%
Southern.....50&5%
So. Western.....50&2½%
Terms, 60 days; 2% cash 10 days. Factory shipments generally delivered.
See also Eave Troughs.

Coolers, Water—

Gal, each..	2	3	4	6	8
Labrador	$1.20	$1.50	$1.80	$2.10	$2.70
Gal.	3	4	5	6	8
Iceland, ea.	$1.80	$2.10	$2.40	$3.00	
Gal.	2	3	4	6	8
Galvanized, ea.	$1.85	$2.00	$2.25	$2.90	$3.90
Galvanized, Lined, side handles, Gal.	2	3	4	6	8
Each	$1.95	$2.15	$2.40	$3.30	$4.15
White Enameled					25%
Agate Lined					25%

Coopers' Tools—
See *Tools, Coopers'.*

Coppers' Soldering—
Soldering Coppers, 3 lbs. to pair and heavier, 23@24¢; lighter than 3 lbs. to pair.....25@26¢

Cord— Sash—
Braided, Drab.....lb. 35¢
Braided, White, Com., Nos. 8 to 12, 24¢; No. 7, 24½¢; No. 6, 25½¢.
Cable Laid Italian.....lb., A, 18¢; B, 16¢
Common India.....lb. 10@10½¢
Cotton Sash Cord, Tw'ted..17@19¢
Patent Russia.....lb...@14¢
Cable Laid Russia....lb...@15¢
India Hemp, Braided..lb...@18¢
India Hemp, Twisted..lb. 12@13¢
Patent India, Twisted..lb. 12@13¢
Anniston Cordage Co.: ₱ lb. solid Braided, Nos. 8 to 12, $0.24; No. 7, $0.24½; No. 6, $0.25½; ₱ doz., 50 ft., Oriole, $2.00; 50 ft., Columbia, $0.85; 50 ft., Victors, $1.00; 50 ft., 6-Thread, $1.10; 60 ft., 3-Thread, $0.95; 50 ft., Manila, $1.40; 60 ft., Jute, $0.75.
Pearl Braided, cotton, No. 6, ₱ lb, 25½¢; No. 7, 25¢; Nos. 8 to 12, 24½¢
Eddystone Braided, Nos. 8, 9 and 10, 25¢; 7, 25½¢; 6, 26¾¢.
Harmony Cable Laid Italian, Nos. 7 to 10.....₱ lb 23 ¢
Peerless:
Cable Laid Italian.....16 ¢
Cable Laid Russian.....14 ¢
Cable Laid India.....12 ¢
Braided India.....18 ¢
Pullman:
Wire Sash Cord.....10%
Sash Cord Attachments, per doz.10¢
Samson, Nos. 8 to 12:
Braided, Drab Cotton.....₱ lb 40 ¢
Braided, Italian Hamp.....₱ lb 40 ¢
Braided, Linen.....₱ lb 55 ¢
Braided, White Cotton or Spot.....₱ lb 35 ¢
Massachusetts, White.....₱ lb 30 ¢
Massachusetts, Drab.....₱ lb 35 ¢
Phoenix, White, Nos. 8 to 12, 27¢; No. 7, 27½¢; No. 6, 28½¢.
Silver Lake:
A, Drab.....45 ¢
A, White.....40 ¢
B, Drab.....40 ¢
B, White.....35 ¢
Italian Hemp.....40 ¢
Linen.....57½¢
See also Chain and Ribbon.

Wire, Picture—
List Oct., '00.....85&10@85&10&10&5%
Hendryx Standard Wire Picture Cord, 85&10%

Cradles—
Grain.....40&12½%

Crayons—
White Round Crayons, gr. 6@6½¢
Cases, 100 gro., $5.00 at factory.

D. M. Steward Mfg. Co.: Case lots, 30%
Genuine, Per gro.
Round Pencil, $2.25; Square Pencil, $1.75; Flat Crayon, $2.50; Metal Workers' Crayon, $3.00; Rolling Mill Crayon, $3.00.

Case lots, 50&20%
Compo. Per gro.
Round Pencil, $1.50; Square Pencil, $1.50; Flat Crayon, $1.50; Metal Workers' Crayon, $2.50; Rolling Mill Crayon, $2.50; Railroad Crayon, $1.00; Compo. Crayon, $4.00.

Zelnicker's Lumber:
Red, Blue, Green.....₱ gro. $6.50
Black.....₱ gro. $4.00
See also Chalk.

Crooks, Shepherds'—
Fort Madison, Heavy.....₱ doz. $7.00
Fort Madison, Light.....₱ doz. $6.50

Crow Bars—See *Bars, Crow.*

Cultivators—
Victor Garden.....50%

Cutlery, Table—
International Silver Company:
No. 12 M'd'm Knives, 1847..₱ doz. $3.50
Star, Eagle, Rogers & Hamilton and Anchor.....₱ doz. $3.00
Wm. Rogers & Son.....₱ doz. $2.50

Cutters— Glass—
H. H. Mayhew Co.....40%
Red Devil.....50%
Smith & Hemenway Co.....50%
Woodward.....40%

Meat and Food—
American.....30%

Nos.	1	2	3	4	B	5
Each	$5	$7	$10	$25	$50	$60

Enterprise:

Nos.	5	10	12	22	32	
Each	$2	$3	$2.75	$4.50	$6	25@25&7½%
No. 202, $1.50						40&7½%

Dixon's.....₱ doz. 40@50%

Nos.	1	2	3	4
	$14.00	$17.00	$19.00	$30.00

Ideal.....40&10@50%
Little Giant.....₱ doz. 40@50%

Nos.	305	310	312	320	322
	$35.00	$48.00	$44.00	$72.00	$68.00

N. E. Food Choppers.....25%
New Triumph No. 605, ₱ doz. $24.00.....40@50%
Russwin Food, No. 1, $24.00; No. 2, $27.00.....45&10&10%
Woodruff's.....₱ doz. 40@50%

Nos.	100	150
	$15.00	$18.00

Enterprise Beef Shavers.....25@30%

Slaw and Kraut—
Henry Disston & Sons:
Slaw, Corn Grater, &c.....40%
Kraut Cutters, 24 x 7, 26 x 8, 30 x 9.....55%
Kraut Cutters, 36 x 12, 40 x 12.....40%
J. M. Mast Mfg. Co.:
Slaw Cutters, 1 Knife....₱ doz. $3.00
Combined Slaw Cutter and Corn Grater.....₱ doz. $4.00
Tucker & Dorsey Mfg. Co.:
Kraut Cutters.....40%
Slaw Cutters, 1 Knife..₱ gr. $18@$20
Slaw Cutters, 2 Knife..₱ gr. $22@$36

Tobacco—
All Iron, Cheap..doz. $4.25@$4.50
Enterprise.....25@30%
National, ₱ doz., No. 1, $21; No. 2, $18.....40%
Sargent's, ₱ doz., No. 2.....60%
Sargent's, Nos. 12 and 21.....60&10%

Washer—
Appleton's, ₱ doz., $16.00....50&10&10%

Diggers, Post Hole, &c.—
Dalbey Post Hole Auger..per doz., $9.00
Iwan's Imp'ved Post Hole Auger.40&5%
Iwan's Vaughan Pattern Post Hole Augers.....₱ doz. $6.25
Iwan's Perfection Post Hole Digger..₱ doz. $8.25
Iwan's Split Handle Post Hole Diggers.....₱ doz. $7.25
Kohler's Universal.....₱ doz. $14.00
Kohler's Little Giant.....₱ doz. $12.00
Kohler's Hercules.....₱ doz. $10.00
Kohler's Invincible.....₱ doz. $9.00
Kohler's Rival.....₱ doz. $8.00
Kohler's Pioneer.....₱ doz. $7.00
Never-Break Post Hole Diggers, ₱ doz., $24.00.....60%
Samson, ₱ doz. $34.00.....25%

Dividers—See *Compasses.*

Drawers, Money—
Tucker's Pat. Alarm Till No. 1, ₱ doz., $18; No. 2, $15; No. 3, $12; No. 4, $18.

Drawing Knives—
See *Knives, Drawing.*

Dressers, Emery Wheel—
Diamond Emery Wheel Dressers....35%
Diamond Wheel Dresser Cutters....35%

Drills and Drill Stocks—
Common Blacksmiths' Drill, each.....$1.50@$1.75
Breast, Millers Falls.....15&10%
Breast, P., S. & W.....40%
Goodell Automatic Drills..40&5@40&10%
Johnson's Automatic Drills, Nos. 2 and 3.....16⅔%
Johnson's Drill Points.....16⅔%
Millers Falls Automatic Drills.33⅓&10%
Ratchet, Curtis & Curtis.....40%
Ratchet, Parker's.....40%
Ratchet, Weston's.....40%
Ratchet, Weston's, Style H Improved.....40%
Ratchet, No. 012.....40%
Ratchet, Whitney's, P., S. & W..50%
Whitney's Hand Drill, No. 1, $10.00; Adjustable, No. 10, $12.00.....33⅓%

Twist Drills—
Bit Stock.....60&10&10@70%
Taper and Straight Shank.. 60&10@60&10&5%

Drivers, Screw—
Screw D'ver Bits, per doz..45@50¢
Balsey's Screw Holder and Driver, ₱ doz., 2½-in., $6; 4-in., $7.50; 6-in., $9.....50%
Buck Bros.' Screw Driver Bits.....30%
Champion.....50%
Edson.....60%
Fray's Hol. H'dle Sets, No. 3, $12..50%
Gay's Double Action Ratchet.....35%
Goodell's Auto..50&10&10@50&10&10&5%
Hurwood.....40%
Mayhew's Black Handle.....40%
Mayhew's Monarch.....40&10%
Millers Falls, Nos. 20 and 21....25&10%
Millers Falls, Nos. 11, 12, 41, 42..15&10%
New England Specialty Co.....50&10%
Sargent & Co.'s:
Nos. 1 and 60.....50&10&10%
Nos. 50, 53 and 55.....60&10%
Nos. 20 and 40.....70&10%
Smith & Hemenway Co.....40&5%
H. D. Smith & Co.'s Perfect H'dle.40%
Stanley R. & L. Co.'s:
No. 64, Varn. Handles.....65%
No. 96.....75%
Victor.....55%
Defiance.....70%
Swan's:
Nos. 7565 to 7568.....50%
No. 7540.....40&10%

Eave Trough, Galvanized—

Territory.	*L. C. L. Galvanized*		
	Galv. Steel.	*Charcoal Iron.*	*Copper.*
Eastern:			
	80&2½%	*70&7½%*	*50%*
Central:			
	75&10&7½%	*70%*	*40&10&5%*
Western and S. W.:			
	70&20&7½%	*60&15&2½%*	*47½%*
So. Western:			
	70&20%	*65&2½%*	*40&10%*

Terms.—2% for cash. Factory shipments generally delivered.
See also Conductor Pipe and Elbows.

Elbows and Shoes—
Factory shipments, all territories:
Galv. Steel and Galv. C. I.
Gauge.....60&10%
No. 26.....50%

No. 24.....25%
No. 22.....10%
Copper.....50%

Elbows, Stove Pipe—
Dover, one piece.....40%
Perfect Elbows (R. M. Co.).....40%

Emery, Turkish—
	4 to 46	54 to 220	Flour.
Kegs.....lb.	5 ¢	5½¢	3½¢
½ Kegs.....lb.	5¼¢	5¾¢	3¾¢
¼ Kegs.....lb.	5½¢	6 ¢	4 ¢
10-lb. cans, 10 in case....	6½¢	7 ¢	6 ¢
10-lb. cans, less than 10.....	10 ¢	10 ¢	8 ¢
Less quantity..	10 ¢	10 ¢	8 ¢

NOTE.—In lots 1 to 3 tons a discount of 10% is given.

Extractors, Lemon Juice
—See *Squeezers, Lemon.*

Fasteners, Blind—
Zimmerman's.....50&10%
Walling's.....40&10%

Cord and Weight—
Ives.....40%

Faucets—
Cork Lined.....50@50&10%
Metallic Key, Leather Lined.. 60&10@70%
Red Cedar.....40&10@50%
Petroleum.....70&10@75%
B. & L. B. Co.:
Metal Key.....60&10%
Star.....60%
West Lock.....50&10%
John Sommer's Peerless Tin Key....40%
John Sommer's Boss Tin Key.....50%
John Sommer's Victor Mtl. Key.50&10%
John Sommer's Duplex Metal Key..80%
John Sommer's Diamond Lock.....40%
John Sommer's I. X. L. Cork Lined...50%
John Sommer's Reliable Cork Lined.. 50&10%
John Sommer's Chicago Cork Lined.60%
John Sommer's O. K. Cork Lined...50%
John Sommer's No Brand, Cedar....50%
John Sommer's Perfection, Cedar....40%
McKenna, Brass:
Burglar Proof, N. P.....25%
Improved, ¾ and ⅞ inch.....25%
Self Measuring:
Enterprise, ℔ doz. $36.00.....40&10%
Lane's, ℔ doz. $36.00.....40&10%
National Measuring, ℔ doz. $36.40&10%

Felloe Plates—
See *Plates, Felloe.*

Files— Domestic—
List revised Nov. 1, 1899.
Best Brands.....70&10@75&10%
Standard Brands.75&10@75&10&10%
Lower Grade....75&10&10@80&10%

Imported—
Stubs' Tapers, Stubs' list, July 24, '97.....33 1-3@40%

Fixtures, Fire Door—
Richards Mfg. Co.:
Universal, No. 103.....$3.75
Special, No. 104.....$3.75
Fusible Links, No. 96.....50%
Expansion Bolts, No. 107.....60&10%

Grindstone—
Net Prices:
Inch.....	15	17	19	21
Per doz.....	$3.25	3.75	4.25	4.75

P., S. & W. Co.....30&10@40%
Reading Hardware Co.....60%
Sargent's.....70%
Stowell's Giant Grindstone Hanger.. ℔ doz. $6.00
Stowell's Grindstone Fixtures, Extra Heavy.....50&10&10%
Stowell's Grindstone Fixtures, Light.

Fodder Squeezers—60&10%
See *Compressors.*

Forks—
NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.
Iowa Dig-Ezy Potato.....60&10%
Victor, Hay.....60&15&2½%
Victor, Manure.....66⅔%
Victor, Header.....65%
Champion, Hay.....66⅔%
Champion, Header.....65%
Champion, Manure.....60&15&2½%
Columbia, Hay.....60&20%
Columbia, Manure.....70%
Columbia, Spading.....70&12½%
Hawkeye Wood Barley.....40%
W. & C. Potato Digger.....60&10%
Acme Hay.....60&20%
Acme Manure, 4 tine.....60&10&5%
Dakota Header.....60&20%
Jackson Steel Barley.....60&20%
Kansas Header.....65%
W. & C. Favorite Wood Barley.....40%
Plated.—See Spoons.

Frames— Saw—
White, S'g't Bar, per doz.75@80¢
Red, S'g't Bar, per doz..$1.00@1.25
Red, Dbl. Brace, per doz.$1.40@1.50

Freezers, Ice Cream—
Qt.....	1	2	3	4	6
Each....	$1.30	$1.60	$1.90	$2.20	$2.80

Fruit and Jelly Presses—
See *Presses, Fruit and Jelly.*

Fry Pans—See *Pans, Fry.*

Fuse— *Per 1000 Feet.*
Hemp.....$2.75
Cotton.....3.20
Waterproof Sgl. Taped..3.65
Waterproof Dbl. Taped..4.40
Waterproof Tpl. Taped..5.15
10&2½%

Gates, Molasses and Oil—
Stebbins' Pattern.....80&10%

Gauges—
Marking, Mortise, &c..50&10@60%
Chapin-Stephens Co.:
Marking, Mortise, &c.50&10@50&10&10%
Scholl's Patent.....50&10@50&10&10%
Door Hangers.....50@50&10%
Stanley R. & L. Co.'s Butt and Rabbet Gauge.....35%
Marking and Mortise.....60%
Wire, Brown & Sharpe's.....25%
Wire, Morse's.....25%
Wire, P., S. & W. Co.....33⅓%

Gimlets— Single Cut—
Numbered assortments, per gro.
Nail, Metal, No. 1, $2.00; 2, $2.30
Spike, Metal, No. 1, $4.00; 2, $4.30
Nail, Wood Handled, No. 1, $2.30; 2, $2.60
Spike, Wood Handled, No. 1, $4.30; 2, $4.60

Glass, American Window
See *Trade Report.*

Glasses, Level—
Chapin-Stephens Co.....60@60&10&10%

Glue, Liquid Fish—
Bottles or Cans, with Brush.. 25&10@50%
International Glue Co. (Martin's)..40%

Grease, Axle—
Common Grade....gro. $4.50@6.00
Dixon's Everlasting..10-℔ pails, ea. 85¢
Dixon's Everlasting, in boxes, ℔ doz. 1 ℔, $1.20; 2 ℔, $2.00
Helmet Hard Oil.....25%

Griddles, Soapstone—
Pike Mfg. Co.....33⅓@33⅓&10%

Grindstones—
Bicycle Emery Grinder.....$6.50
Bicycle Grindstones, each.....$2.50@3.00
Pike Mfg. Co.:
Improved Family Grindstones, per inch, ℔ doz.....$2.00 } 33⅓%
Pike Mower and Tool Grinder, each.....$6.00 } 33⅓%

Grips, Nipple—
Perfect Nipple Grips.....40&10&2%

Halters and Ties—
Cow Ties.....60&10@60&10&5%
Covert Mfg. Co.:
Web.....45%
Jute Rope.....45%
Sisal Rope.....33⅓%
Cotton Rope.....45%
Hemp Rope.....45%
Covert's Saddlery Works:
Web and Leather Halters.....70%
Jute and Manila Rope Halters....70%
Sisal Rope Halters.....60&20%
Jute, Manila and Cotton Rope Ties.....70%
Sisal Rope Ties.....60&10%
Oneida Community:
Am. Coil and Halters.....40@40&5%
Am. Cow Ties.....45@50%
Niagara Coil and Halters..45@50&5%
Niagara Cow Ties....45&5@50&10&5%
E. T. Rugg & Co.:
Leather Halters.....50%
Web Halters and Webbing.....60%
Jute and Sisal Rope Halters.....60%
Jute and Sisal Horse and Cattle Ties.....60%
Cotton Horse Ties.....60%
Livery Ties, Braided.....60%

Hammers—
Handled Hammers—
Heller's Machinists'...40&10@40&10&10%
Heller's Farriers.....40&10@40&10&10%
Magnetic Tack, Nos. 1, 2, 3, $1.25, $1.50, $1.75.....50%
Peck, Stow & Wilcox, Steel.....50%
Fayette R. Plumb:
Plumb, A. E. Nail..... 33⅓&7½@33⅓&10&7½%
Engineers' and B. S. Hand..... 50&7½&5@50&10&7½&5%
Machinists' Hammers.50&5@50&10&5%
Riveting and Tinners' ..... 40&2½@40&10&2½%
Sargent's C. S. New List.....40%

Heavy Hammers and Sledges—
Under 3 lb., per lb., 50¢...80&10%
3 to 5 lb., per lb., 40¢.....80&10%
Over 5 lb., per lb., 30¢..80&10&10%
Wilkinson's Smiths'...lb. 9½@10¢

Handles—
Agricultural Tool Handles
Axe, Pick, &c.....60&10@60&10&5%
Hoe, Rake, &c.....45@50%
Fork, Shovel, Spade, &c.:
Long Handles.....45@50%
D Handles.....50@50&5%

Cross-Cut Saw Handles—
Atkins'.....40%
Champion.....45@45&10%
Disston's.....50%

Mechanics' Tool Handles—
Auger, assorted...gro. $2.50@$3.00
Brad Awl.....gro. $1.65@$1.75
Chisel Handles:
Apple Tanged Firmer, gro. assorted.....$2.40@$2.65
Hickory Tanged Firmer, gro. assorted.....$2.15@$2.40
Apple Socket Firmer, gro. assorted.....$1.75@$1.95
Hickory Socket Firmer, gro. assorted.....$1.45@$1.60
Hickory Socket Framing, gro. assorted.....$1.60@$1.75
File, assorted.....gro. $1.30@$1.40
Hammer, Hatchet, &c. 60&10@60&10&5%
Hand Saw, Varnished, doz. 80&85¢; Not Varnished...65@75¢
Plane Handles:
Jack, doz. 30¢; Jack, Bolted.75¢
Fore, doz. 45¢; Fore, Bolted.90¢
Chapin-Stephens Co.:
Carving Tool.....40@40&10%
Chisel.....65@65&10%
File and Awl.....65@65&10%
Saw and Plane.....40@40&10%
Screw Driver.....40@40&10%
Millers Falls Adj. and Ratchet Auger Handles.....15&10%
Nicholson Simplicity File Handle.... ℔ gro. $0.85@$1.50

Hangers—
NOTE.—Barn Door Hangers are generally quoted per pair, without track, and Parlor Door Hangers per double set with track, &c.

Allith Mfg. Co.:
Reliable, No. 1.....per doz. $8.00
Reliable, No. 2.....per doz. $9.00
Chicago Spring Butt Co.:
Friction.....25%
Oscillating.....25%
Big Twin.....25%
Chisholm & Moore Mfg. Co.:
Baggage Car Door.....50%
Elevator.....30%
Railroad.....50%
Cronk & Carrier Mfg. Co.:
Loose Axle.....60&10%
Roller Bearing.....70%
Griffin Mfg. Co.:
Solid Axle, No. 10. $12.00.....70%
Roller Bearing, No. 11, $15.00.70%
Roller Bearing, Ex. Hy., No. 22, $18.00.....70%
Hinged Hangers, $16.00....60&10%
Lane Bros. Co.:
Parlor, Ball Bearing.....$4.00
Parlor, Standard.....$3.15
Parlor, No. 105.....$2.85
Parlor, New Model.....$2.80
Parlor, New Champion.....$2.25
Barn Door, Standard.....60&5%
Hinged.....net $6.40
Covered.....60&2%
Special.....70&5%
Lawrence Bros.:
Advance.....60&10%
Cleveland.....75%
Clipper, No. 75.....60%
Crown.....60&10%
Easy Parlor Door, Dbl. Sets, $2.50; Single Sets, $1.25.
Giant.....60&5%
Hummer.....70&5%
New York.....60&10%
Peerless.....75%
Sterling.....60&10%
McKinney Mfg. Co.:
No. 1, Special, $15.....60&10%
No. 2, Standard, $18.....60&10%
Hinged Hangers, $16.....50%
Meyers' Stayon Hangers.....60&5%
Richards Mfg. Co.:
Hangers, Nos. 47, 48, 147, 247, 60&5%
Pioneer Wood Track No. 3..$2.00
Ball B'r'g St'l Track No. 10,50&10%
Roller B'r'g St'l Track No. 12.$2.15
Roller B'r'g St'l Track No. 13.$2.30
Roller B'r'g, Nos. 39, 41, 43, 70&10%
Hero, Adj. Track No. 19..50&10%
Adjustable Track Tandem Trolley Track No. 16.....50&10%
Seal, Steel Track No. 8.....$2.25
Auto Adj. Track No. 22..50&10%
Trolley B. D. No. 17.....$1.25
Trolley F. D. No. 120.....$2.10
Trolley F. D. No. 121.....$2.25
Trolley F. D. No. 150.....$2.35
Safety Underwriters F. D. No. 101.....60%
Tandem No. 41, 2½ and 3 60&10%
Palace, Adjustable Track No. 132.....50&10%
Royal, Adjustable Track No. 122.....50&10%
Ives' Wood Track No. 1.....$2.00
Trolley B. D. No. 20.....50&10%
Trolley B. D. No. 24.....$1.30
Trolley B. D. No. 27.....$1.40
Trolley B. D. No. 28.....$1.60
Roller Bearings, Nos. 37, 38, 39, 41, 43; 44, Sizes 1 and 2..70&10%
Anti-friction, No. 42.....60&10%
Anti-friction, No. 44, Sizes 2½ and 3.....60&10%
Hinged Tandem No. 48....60&5%
Folding Door B. B. Swivel No. 133.....40%
Safety Door Hanger Co.:
Storm King Safety.....60%
U. S. Standard Hinge.....60%
Stowell Mfg. & Foundry Co.:
Acme Parlor Ball Bearing....40%
Ajax Hinge Door.....60%
Apex Parlor Door.....50&10&5%
Atlas.....60%
Baggage Car Door.....50%
Climax Anti-Friction.....50&10%
Elevator.....40%
Express.....50%
Freight Car Door.....60%
Interstate.....60&10%
Lundy Parlor Door.....50&10%
Magic.....60%
Matchless.....60&10%
Nansen.....70&5%
Parlor Door.....50&10%
Railroad.....50&10%
Rex Hinge Door.....60%
Street Car Door.....50%
Steel, Nos. 300, 404, 500....50&10%
Underwriters' Fire Door.....40%
Wild West Warehouse Door..50%
Zenith for Wood Track....50&10%
A. L. Sweet Iron Works:
Check Back.....70%
Climax Anti-Friction.....50&10%
Eagle.....70%
Hylo Hinge.....60%
New Perfection.....60%
Pilot.....60%
Pilot Hinge.....60%
Rider Wooster.....65%
Western Pattern.....70%
Taylor & Boggis F'y Co.'s Kidder's Roller Bearing.50&15&10&5%

Extra 5@10% often given.

Hangers— Garment—
Pullman Trouser, ℔ gro., 1 pair Flat Aluminoy, $9.00; 1 pair Round Nickeled, $9.00; 4 pair Round Nickeled, $27.00; 1 pair Flat Gun Metal, $12.00; 1 pair Flat Black Enameled, $7.50; 1 pair Wood Clamp, $13.00; Skirt Hangers, Folding, per gro., $21.00; Coat Hangers, Folding, per gro., $8.00; Garment Hanger Rods, Round Nickeled, per gro., $15.00; Garment Hanger Loops, Round Nickeled, per gro.....$15.00
Victor Folding.....℔ gro. $9.60
Western, W. G. Co.....70&10%

Gate—
Myers' Patent Gate Hangers, ℔ doz. net.....$4.50

Joist and Timber—
Lane Bros. Co.....30%

Hasps—
Griffin's Security Hasp.....50%
McKinney's Perfect Hasp, ℔ doz..50%

Hatchets—
Regular list, first quality....50%
Second quality $1.00 per doz. less than first quality.

Heaters, Carriage—
Clark, No. 5, $1.75; No. 5B, $2.00; No. 3, $2.25; No. 3D, $2.75; No. 7D, $3.00; No. 3E, $3.25; No. 1, $3.50.....15%
Clark Coal, ℔ doz. $0.75.....10%

Hinges—
Blind and Shutter Hinges—
Surface Gravity Locking Blind: (Victor; National; 1868 O. P.; Niagara; Clark's O. P.; Clark's Tip; Buffalo.)
No.....	1	3	5
Doz. pair.....	$0.75	1.35	2.70

Mortise Shutter: (L. & P., O. S., Dixie, &c.)
No.....	1	1½	2	2½
Doz. pair.....	$0.70	.65	.60	.55

Mortise Reversible Shutter (Buffalo, &c.):
No.....	1	1½	2
Doz. pair.....	$0.70	.65	.60

North's Automatic Blind Fixtures, No. 2, for Wood, $9.00; No. 3, for Brick, $11.50.....10%
Charles Parker Co.....70@75%
Parker Wire Goods Co.:
Hale & Benjamin Automatic Blind Hinges.....20%
Hale's Blind Awning Hinges, No. 110, for wood, $9.00; No. 111, for brick, $9.00.....20%
Reading's Gravity.....60%
Sargent's, Nos. 1, 3, 11 and 13..75&10%
Stanley's Steel Gravity Blind Hinges, ℔ doz. sets, without screws, $0.90; with screws, $1.20.
Wrightsville Hardware Co.:
O. S., Lull & Porter.....75&10&5%
Acme, Lull & Porter.....75&10%
Queen City Reversible.....75&10%
Shepard's Noiseless, Nos. 60, 65, 55.....75&10%
Niagara, Gravity Locking, Nos. 1, 3 & 5.....75&10&3%
1868, Old Pat'n, Nos. 1, 3 & 5.... 75&10&5%
Tip Pat'n, Nos. 1, 3 & 5....75&10&5%
Buffalo Gravity Locking, Nos. 1, 3 & 5.....75&10&5%
Shepard's Double Locking, Nos. 20 & 25.....70%
Champion Gravity Locking, No. 75.75%
Steamboat Gravity Locking, No. 10.75%
Pioneer, Nos. 060, 45 & 5½.....75%
Empire, Nos. 101 & 103.....70%
W. H. Co.'s Mortise Gravity Locking, No. 2.....60%

Gate Hinges—
Clark's or Shepard's—Doz. sets:
No.....	1	2	3
Hinges with L't'chs.	$2.00	2.70	5.00
Hinges only.....	1.40	2.05	3.80
Latches only.....	.70	.70	.35

New England:
With Latch.....doz. ....@$2.00
Without Latch...doz. ....@$1.60
Reversible Self-Closing:
With Latch.....doz. ....@$1.75
Without Latch...doz. ....@$1.35
Western:
With Latch.....doz. $1.75
Without Latch.....doz. $1.15
Wrightsville Hardware Co.:
Shepard's or Clark's, doz. sets,
Nos.	1	2	3
Hinges with Latches.	$2.00	2.70	5.00
Hinges only.....	1.40	2.05	3.80
Latches only.....	.70	.70	1.35

Pivot Hinges—
Bommer Bros. Pivot.....40%
Lawson Mfg. Co. Matchless.....40%

Spring Hinges—
Holdback, Cast Iron...$6.50@$7.00
Non-Holdback, Cast Iron $6.25@$6.75
J. Bardsley:
Bardsley's Non-Checking Mortise Floor Hinges.....45%
Bardsley's Patent Checking..15%
Bommer Bros.:
Bommer Ball Bearing Floor Hinges.....40%
Bommer Spring Hinges.....40%
No. 999 Wrot. Steel Hold Back, ℔ gr. $9.00
Chicago Spring Butt Co.:
Chicago Spring Hinges.....25%
Triple End Spring Hinges....50%
Chicago (Ball Bearing) Floor Hinge.....50%
Garden City Engine House....25%
Keene's Saloon Door.....25%
Columbian Hardware Co.:
Acme, Wrought Steel.....30%
Acme, Brass.....25%
American.....30%
Columbia, No. 14.....℔ gr. $9.00
Columbia, No. 18.....℔ gr. $25.00
Columbia, Adjustable, No. 7, ℔ gr. $12.00
Gem, new list.....30%
Clover Leaf.....℔ gr. $12.00
Oxford, new list.....30%
Lawson Mfg. Co., Matchless....30%
Richards Mfg. Co.:
Superior Double Acting Floor Hinges.....40%
Shelby Spring Hinge Co.:
Buckeye All Steel Holdback Screen Door.....℔ gr. $9.00
Ball Bearing Floor Hinge....50%
Ohio Detachable Screen Door Hinge.....℔ gr. $12.00
Superior Spring Hinge Co.:
Superior Floor Hinges.....33⅓%
The Stover Mfg. Co.:
Ideal, No. 16, Detachable, ℔ gr. $12.50
Ideal, No. 4.....℔ gr. $9.00
New Idea No. 1.....℔ gr. $9.00
New Idea, Double Acting....45%
New Idea Floor.....45%

Extra 10% often given on most of these Hinges.

Van Wagoner:
Ball Bearing.....25%
No. 777 Sh't Steel Holdb'k.℔ gro. pr.$9

Wrought Iron Hinges—
Strap and T Hinges, &c., list December 20, 1904:
Light Strap Hinges...65%
Heavy Strap Hinges..75%
Light T Hinges.....60%
Heavy T Hinges.....55%
Extra H'y T Hinges..70%
Hinge Hasps.....45%
Cor. Heavy Strap....75%
Cor. Ex. Heavy T..70&10%

Extra 10@10&10%

Screw Hook and Strap. 6 to 12 in. .lb. 3¾¢; 14 to 20 in. .lb. 3½¢; 22 to 36 in. .lb. 3¼¢

Screw Hook and Eye:
¾ to 1 inch.....lb. 6½¢
⅝-inch.....lb. 7½¢
½-inch.....lb. 8½¢

Hitchers, Stall—
Covert Mfg. Co., Stall Hitchers..30&2%

Hods—Coal—

	Per doz.			
Inch	15	16	17	18
Galv. Open	$2.50	2.75	3.00	3.25
Jap. Open	$1.90	2.10	2.25	2.55
Galv. Funnel	$3.00	3.30	3.60	3.90
Jap. Funnel	$2.45	2.65	2.85	3.30

Masons' Etc.—
Cleveland Wire Spring Co.:
Steel Brick, No. 162.....each $0.95
Steel Mortar, No. 158.....each $1.25

Hoes—Eye—
Scovil and Oval Pattern.....60&10@60&10&10%
Grub, list Feb. 23, 1899.....70&10@75&10%
D. & H. Scovil.....33⅓%

Handled—
NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.
Cronk's Weeding No. 1, $2.00; No. 2, $2.25
Ft. Madison Cotton Hoe....70&10&10%
Ft. Madison Crescent Cultivator Hoe, ₱ doz.....70&10%
Ft. Madison Mattock Hoes:
Regular Weight.....₱ doz. 62½%
Junior Size.....₱ doz. $4.00
Ft. Madison Sprouting Hoe..₱ doz. 50%
Ft. Madison Dixie Tobacco Hoe.....75&10&7½%
Kretsinger's Cut Easy.....70&10%
Warren Hoe.....45&10%
W. & C. Ivanhoe.....75&2%
B. B. 6 in., Cultivator Hoe.....$3.15
B. B., 6½ in.....$3.35
Acme Wedding.....₱ doz., net, $4.35
W. & C. L'tning Shuffle Hoe, ₱ doz. $4.85

Hoisting Apparatus—
See *Machines, Hoisting.*

Holders—Bit—
Angular, ₱ doz. $24.00.....45&10%

Door—
Bardsley's.....45%
Empire.....50%
Pullman.....50%
Superior.....33⅓%

File and Tool—
Nicholson File Holders and File Handles.....33⅓@40%

Fruit Jar—
Triumph Fruit Jar Holder, ₱ gross, $10.80; ₱ doz.....$1.25

Hones—Razor—
Pike Mfg. Co., Belgian, German and Swaty.....50%

Hooks—Cast Iron—
Bird Cage, Reading.....40%
Bird Cage, Sargent's List.....60&10%
Ceiling, Sargent's List, Nos. 29, 32, 33, 129, 132, 133 and 135.....50&10&10%
Clothes Line, Reading List.....40%
Clothes Line, Sargent's List..50&20&10%
Coat and Hat, Sargent's List...50&10%
Clothes Line, Stowell's.....70%
Coat and Hat, Reading.....45&20%
Coat and Hat, Stowell's.....70%
Coat and Hat, Wrightsville.....65%
Harness, Reading List.....40%
Harness, Stowell's.....60%
School House, Stowell's.....70%

Wire—
Belt.....80&10@..%
Wire C. & H. Hooks:.....75&10@75&10&10%
Columbian Hdw Co., Gem.....70&10%
Parker Wire Goods Co., King..70&10%
Van Wagoner, Coat and Hat.....70%
Western W. G. Co. Molding.....75%
Wire Goods Co.:
Acme.....60&10%
Chief.....70%
Crown.....75%
Czar.....65%
V Brace.....75%
Czar Harness.....50&10%

Wrought Iron—
Box, 6 in., per doz., $1.00; 8 in., $1.25; 10 in., $2.50.
Cotton.....doz. $1.05@$1.25
Wrought Staples, Hooks, &c.—See Wrought Goods

Miscellaneous—
Hooks, Bench, see *Stops, Bench.*
Bush, Light, doz. $4.75; Medium, $5.35; Heavy, $6.25
Grass, best, all sizes, per doz. $1.60
Grass, common grades, all sizes, per doz......$1.30
Whiffletree.....lb. 5¾@6¢
Hooks and Eyes:
Brass.....60&5@60&10&5%
Malleable Iron.....70@70&10%
Covert Mfg. Co. Gate and Scuttle Hooks.....40%
Covert Saddlery Works' Self Locking Gate and Door Hook.....60%
Ft. Madison Cut-Easy Corn Hooks, ₱ doz. $3.25 net
Bench Hooks—See Bench Stops.
Corn Hooks—See Knives, Corn.

Horse Nails—
See *Nails, Horse.*

Horseshoes—
See *Shoes, Horses.*

Hose, Rubber—
Garden Hose, ¾-inch:
Competition.....ft. 5 @ 6 ¢
3-ply Guaranteed..ft. 8 @ 9 ¢
4-ply Guaranteed..ft. 10 @11 ¢
Cotton Garden, ¾-in., coupled:
Low Grade.....ft. 8 @ 9 ¢
Fair Quality.....ft. 10 @11 ¢

Irons—Sad—
From 4 to 10.....lb. 3 @3¼¢
B. B. Sad Irons.....lb. 3¼@3½¢

Mrs. Potts', cents per set:

Nos.	50	55	60	65
Jap'd Tops	68	65	78	75
Tin'd Tops	71	68	81	78

New England Pressing.lb. 3¾@4¢

Pinking—
Pinking Irons.....doz. 60¢

Irons, Soldering
See *Coppers.*

Jacks, Wagon—
Covert Mfg. Co.:
Auto Screw.....30&2%
Steel.....45%
Covert's Saddlery Works:
Daisy.....60&10%
Victor.....60%
Lockport.....50%
Lane's Steel.....30&10&2%
Richards' Tiger Steel, No. 130...50&10%
Smith & Hemenway Co.'s.....25%

Kettles—
Brass, Spun, Plain.....20@25%
Enameled and Cast Iron—See Ware, Hollow.

Knives—
Butcher, Kitchen, &c.—
Foster Bros. Butcher, &c.....30%
Wilkinson Shear & Cutlery Co.....60%

Corn—
Wilkinson Wilcut Brand Knives and Hooks.....60%
Wilmington Acme, ₱ doz., $2.65; Dent, $2.75; Adj. Serrated, $2.20; Serrated, $2.10; Yankee No. 1, $1.50; Yankee No. 2, $1.15.

Drawing—
Standard List.....75&5@75&10%
U. E. Jennings & Co., Nos. 45, 46...60%
Jennings & Griffin, Nos. 41, 42.....60%
Ohio Tool Co.'s.....70%
Swan's.....75%
Watrous.....16⅔%
L. & J. J. White.....20&5@25%

Hay and Straw—
Serrated Edge, per doz. $5.75@6.00
Iwan's Sickle Edge.....₱ doz. $9.50
Iwan's Serrated.....₱ doz. $10.00

Mincing—
Buffalo.....₱ gro. $13.00

Miscellaneous—
Farriers'.....doz. $3.00@$3.25
Wostenholm's.....₱ doz. $3.00@3.25

Knobs—
Base, 2½-inch, Birch, or Maple, Rubber Tip.....gro. $1.25@$1.50
Carriage, Jap., all sizes.....gro. 40@45¢
Door, Mineral.....doz. 65@70¢
Door, Por. Jap'd.....doz. 70@75¢
Door, Por. Nickel..doz. $2.05@2.15
Bardsley's Wood Door, Shutters, &c. 15%
Picture, Sargent's.....60&10&10%

Lacing, Leather—
See *Belting, Leather—*

Ladders, Store, &c.—
Lane's Store.....25%
Myers' Noiseless Store Ladders....50%
Richards Mfg. Co.:
Improved Noiseless, No. 112.....50%
Climax Shelf, No. 113.....50%
Trolley, No. 109.....50%

Ladles, Melting—
L. & G. Mfg. Co. (low list).....25%
P. S. & W.....50%
Reading.....60%
Sargent's.....50&10%

Lanterns—Tubular—
Regular Tubular, No. 0.....doz. $4.25@4.50
Lift Tubular, No. 0.....doz. $4.75@5.00
Hinge Tubular, No. 0.....doz. $4.75@5.00
Other Styles.....40@40&5%

Bull's Eye Police—
No. 1, 2¾-inch.....$2.75@3.00
No. 2, 3-inch.....$3.00@3.25

Lasts and Stands, Shoe—
Stowell's Atlas, Malleable Iron.....50%
Stowell's Badger, Cast Iron.....50%

Latches—Thumb—
Roggin's Latches, with screw..doz. 35@40¢

Door—
Cronk & Carrier Mfg. Co., No. 101, ₱ doz. $2.00
Cronk & Carrier Mfg. Co., Latch, Hasp and Staples.....50%
Richards' Bull Dog, Heavy, No. 125.....50&5%
Richards' Trump, No. 127.....$1.50

Leaders, Cattle—
Small.....doz. 50¢; *large*, 60¢
Covert Mfg. Co.:
Cotton, Hemp and Jute, 45%; Sisal, 33⅓%.

Lifters, Transom—
R. & E.....33⅓%

Lines—

Wire Clothes, Nos.	18	19	20
100 feet	$2.25	2.00	1.75
75 feet	$1.75	1.35	1.10

Anniston Waterproof Clothes, 50 ft., ₱ gro., $25.00; Gilt Edge, $23.00; Air Line, $23.00; Acme, $18.00; Alabama, $17.00; Empire, $16.00; Advance, $14.00; Eclipse, $13.50; Chicago, $11.50; Standard, $10.50; Columbia, $9.50; Allston, $13.50; Calhoun, $12.00.
Samson Cordage Works:
Solid Braided Chalk, Nos. 0 to 3..40%
Silver Lake Braided Chalk, No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50.....₱ gr. 20%
Masons' Lines, Shade Cord, &c.:
White Cotton, No. 3¼, $1.50; No. 4, $2.00; No. 4½, $2.50; Colors, No. 3¼, $1.75; No. 4, $2.25; No. 4½, $2.75; Linen, No. 3¼, $2.50; No. 4, $3.50; No. 4½, $4.50.....20%
Tent and Awning Lines: No. 5, White Cotton, $7.50; Drab Cotton, $8.50.....20%
Clothes Lines, White Cotton: 50 ft., $2.75; 60 ft., $3.25; 70 ft., $3.75; 75 ft., $4.00; 80 ft., $4.25; 90 ft., $4.75; 100 ft., $5.25.....20%

Locks—Cabinet—
Cabinet Locks..33⅓@33⅓&7½%
Door Locks, Latches, &c—
NOTE.—Net Prices are very often made on these goods.
Reading Hardware Co.....40%
R. & E. Mfg. Co.....
Sargent & Co.....40&10%
Stowell's Steel Door Latches.....

Elevator—
Stowell's.....

Padlocks—
Wrought Iron....75&10&5@80&10%
Net prices are general.
R. & E. Mfg. Co. Wrought Steel and Brass.....75&10%

Sash, &c.—
Ives' Patent:
Bronze and Brass.....62½%
Crescent.....50&10%
Iron.....62½%
Window Ventilating.....60%
Robison Patent Ventilating Sash Lock.....40%
Wrought Bronze and Brass.....55%
Wrought Steel.....55%
Pullman Patent Ventilating Lock..25%
Reading.....40%

Machines—Boring—
Com. Upr't, without Augers.$2.00
Com. Ang'l'r, without Augers.$2.25
Swan's Improved.....40&10%
Angular.
Jennings', Nos. 1 and 4.....35&5%
Millers' Falls.....5.75
Snell's, Rice's Pat. 2.50 2.75

Corking—
Reisinger Invincible Hand Power.....₱ doz. $48.00

Fence—
Williams' Fence Machines....each, $5.50

Hoisting—
Moore's Anti-Friction Differential Pulley Block.....30%
Moore's Hand Hoist, with Lock Brake.....20%

Ice Cutting—
Chandler's.....12½%

Washing—

Boss Washing Machine Co.:	Per doz.
Boss No. 1	$57.00
Boss Rotary	$54.00
Champion Rotary Banner No. 1	$54.00
Standard Champion No. 1	$48.00
Standard Perfection	$26.00
Cintl Square Western	$30.00
Uneeda American, Round	$30.00

Mallets—
Hickory.....45&5@50%
Lignumvitæ.....45&5@50%
Tinners' Hickory and Applewood.....doz. 45&5@50%

Mangers, Stable—
Swett Iron Works.....50%

Mashers, Vegetable—
Western, W. G. Co., Potato....60&10%

Mats, Door—
Elastic Steel (W. G. Co.), new list.. 50&10%
Keystone Wire Matting Co.:
Keystone.....50%
Ideal.....50%

Mattocks—
See *Picks and Mattocks.*

Milk Cans—See *Cans, Milk.*

Mills, Coffee, &c.—
Enterprise Mfg. Co.....25@30%
National list Jan. 1902.....30%
Parker's Columbia & Victoria..50&10&60%
Parker's Box and Side.....50&10@60%
Swift, Lane Bros. Co.....30%

Mowers, Lawn—
NOTE.—Net prices are generally quoted
Cheapest.....*all sizes, $1.85@2.00*
Cheap.....*all sizes, $2.00@2.50*
Better Grade..*all sizes, $2.50@4.50*

	12	14	16	18-in.
High Grade	$4.50	4.75	5.00	5.25

Continental.....60&5%
Great American.....70%
Great American Ball B'r'g, new list..70%
Quaker City.....70%
Pennsylvania.....60&5%
Pennsylvania, Jr., Ball Bearing....60%
Pennsylvania Golf.....50%
Pennsylvania Horse.....33⅓&5%
Pennsylvania Pony.....40&5%
Granite State:
Style A, Low Wheel....70&10&10&5%
Style B, Low Wheel.....70&10&5%
Style C, High Wheel.....70&10%
Style D, High Wheel.....70%
Philadelphia:
Styles M, S, C, K, T.....70&5%
Style A, all Steel.....60&5%
Style E, High Wheel.....70&10&5%
Drexel and Gold Coin, special list..50%

Nails—
Wire Nails and Brads, Miscellaneous.....85&10@85&10&5%
Cut and Wire. See *Trade Report.*
Hungarian, Finishing, Upholsterers' &c. See *Tacks.*

Horse—

Nos.	6	7	8	9	10	
Ancnor	23	21	20	19	18	...40&5%
Champlain	28	26	25	24	23	.....50%
Coleman	13	12	12	11	11	.....net
New Haven	23	21	20	19	18	...40&5%
Putnam	23	21	20	19	18	...33⅓%
New Putnam	19	18	17	16	16	..10&10%

Western.....₱ lb 8½¢
Jobbers' Special Brands.....per lb. 9@10¢

Picture—

Fl'y	2	2½	3	3½ in.
Brass H'd	.45	.55	.60	.70 .. gro
Por. Head	1.10	1.10	1.10	.. gro

Nippers—
See *Pliers and Nippers.*

Nuts—
Cold Punched: *Off list.*
Square, Blank or Tapped..4.90@5.00¢
Hexagon, Blank or Tapped..5.30@5.40¢
*Square, Blank, C. & T.*5.20@5.30¢
Hexagon, Blank, C. & T..5.90@6.00¢
Hot Pressed:
Square, Blank.....5.10@5.20¢
Hexagon, Blank.....5.50@5.60¢
Square, Tapped.....5.00@5.10¢
Hexagon, Tapped.....5.40@5.50¢

Oakum—
Best.....lb. 6¼@6½¢
U. S. Navy.....lb. 5¾@6¢
Navy.....lb. 4½@5¢
Plumbers' Spun Oakum...2½@3¢
In carload lots ⅛¢ lb. off, f.o.b. New York.

Oil Tanks—See *Tanks, Oil.*

Oilers—
Brass and Copper.....50&10%
Tin or Steel.....70@70&5%
Zinc.....70@70&5%
Chase or Paragon:
Brass and Copper.....50&10%
Tin or Steel.....65&10%
Zinc.....65&10%
Malleable, Hammers' Imp'ed, Nos. 11, 12 and 13.....20%
Malleable, Hammers' Old Pattern, Nos. 1, 2 and 3.....50%
American Tube & Stamping Co.:
Spring Bottom Cans.....70@70&10%
Railroad Oilers, &c.....60@60&10%

Openers—Can—*Per doz.*
Sprague, Iron Handle....30@35¢
Sprague, Wood Handle...35@40¢
Sardine Scissors.....$1.75@$3.00
National.....50&10%
Stowell's Sprague.....₱ doz. 35@45¢
Vim Tin Shear and Can Opener, ₱ doz., 75c.; per gro., $7.50

Egg—
Nickel Plate.....₱ doz., $2.00
Silver Plate.....₱ doz., $4.00

Packing—
Asbestos Packing, Wick and Rope.....17@22¢

Rubber—
(*Fair quality goods.*)
Sheet, C. I......11@12¢
Sheet, C. O. S......11@12¢
Sheet, C. B. S......12@13¢
Sheet, Pure Gum.....40@45¢
Sheet, Red.....40@50¢
Jenkins' '96, ₱ lb 80¢.....25@25&5%

Miscellaneous—
American Packing...lb. 7@10 ¢
Cotton Packing.....lb. 16@25 ¢
Italian Packing.....lb. 9@12½¢
Jute.....lb. 4@ 4½¢
Russia Packing.....lb. 8@11 ¢

Pails, Creamery—
R. M. Co., with gauges—No. 1, $6.25; No. 2, $6.50 ₱ doz.

Pails, Water, Well, &c.—
See *Buckets.*

Pans—Dripping—
Standard List.....65&10%

Fry—
Common Lipped:

Nos.	1	2	3	4	5
Per doz.	$0.75	0.80	0.90	1.10	1.30

Refrigerator, Galva.—

Inch	12	14	16	18
Per doz.	$1.95	2.25	2.80	3.15

Roasting and Baking—
Regal, R. M. Co., ₱ doz., Nos. 5, $1.50; 10, $5.25; 20, $5.75; 30, $6.25.
Savory, ₱ doz., net, Nos. 200, $9.00; 400, $15.00.
Simplex, ₱ gro.:

No.	40	50	60	140	150	160
	$30.00	35.90	42.00	34.00	39.00	46.00

Paper—Building Paper

Asbestos:	lb.	
Roll Board or Building Felt, 6 to 30 lb., per 100 sq. ft.	6¢	1-ply
Roll Board or Building Felt, 3-32 and ⅛ in., 45 to 60 lbs., per 100 sq. ft.	8¢	33
Mill Board, Sheet, 40 x 40 in., 1-32 to ⅛ in.	10¢	

Per roll
Rosin Sized Sheathing; 500 sq. ft. Light weight, 25 lbs. to roll.....$5@40¢
Medium weight, 30 lbs. to roll.....40@45¢
Heavy weight, 40 lbs. to roll...56@60¢
Black Water Proof Sheathing, 500 sq. ft., 1 ply, 65¢; 2 ply, 85¢; 3 ply, $1.10; 4 ply, $1.25.
Deafening Felt, 9, 6 and 4½ sq. ft. to lb. ton.....$18.00
Red Rope Roofing, 250 sq. ft. per roll.....$1.75

Tarred Paper—
1 ply (roll 300 sq. ft.), ton.....$32.50@35.50
2 ply, roll 108 sq. ft......55¢
3 ply, roll 108 sq. ft......75¢
Slater's Felt (roll 500 sq. ft.)..70¢

Sand and Emery—
Flint Paper and Cloth.60@60&10%
Garnet Paper and Cloth....25%
Emery Paper and Cl'h.60@60&10%

Parers—Apple—

Advance	₱ doz.	$4.00
Baldwin	₱ doz.	$4.00
Bonanza Improved	each	$6.50
Daisy	₱ doz.	$4.00
Dandy	each	$7.50
Eureka Improved	each	$20.00
Family Bay State	₱ doz.	$15.00
Improved Bay State	₱ doz.	$36.00
Little Star	₱ doz.	$5.00
New Lightning	₱ doz.	$7.00
Reading 72	₱ doz.	$3.25

Reading 78.....℔ doz. $6.25
Rocking Table.....℔ doz. $6.20
Turn Table '98.....℔ doz. $6.00
White Mountain.....℔ doz. $5.00

Potato—
Saratoga.....℔ doz. $7.00
White Mountain.....℔ doz. $6.00

Picks and Mattocks—
List Feb. 23, 1899.....75%
Cronk's Handled Garden Mattock, ℔ doz., $6.40.....33⅓%

Pinking Irons—
See *Irons, Pinking.*

Pins, Escutcheon—
Brass.....60@60&10%
Iron, list Nov. 11, '85..60@60&10%

Pipe, Cast Iron Soil—
Carload lots.
Standard, 2-6 in..50&10@50&10&5%
Extra Heavy, 2-6 in......65&10%
Fittings.....70&10@70&10&5%

Pipe, Merchant—
Consumers, Carloads.

	Steel. Blk.	Steel. Galv.	Iron. Blk.	Iron. Galv.
⅛ & ¼ in.	71%	55%	68%	52
⅜ in.	73%	59%	70%	56
½ in.	75%	63%	72%	60
¾ to 6 in.	79	69	76½%	66⅔
7 to 12 in.	74%	59%	71½%	56

Pipe, Vitrified Sewer—
Carload lots.
Standard Pipe and Fittings, 2 to 24 in.:
New England.....68%
New York and New Jersey.71%
*Maryland, Delaware, E. Pa.*75%
West. Pa. and West Va.....77½
Virginia.....76%
Ohio, Michigan and Ky.....77%
Indiana.....77½
NOTE.—Carload lots are generally delivered.

Pipe, Stove—
Edwards' Nested Stove Pipe:

	C. L.	L. C. L.
5 in., per 100 joints	$7.00	$8.00
6 in., per 100 joints	7.50	8.50
7 in., per 100 joints	8.50	9.50

Planes and Plane Irons—
Wood Planes—
Bench, first qual......40&10%
Bench, Second qual......50&10%
Molding.....33⅓&10%
Bailey's (Stanley R. & L. Co.).....40%
Chapin-Stephens Co.:
Bench, First Quality.....40@40&10%
Bench, Second Quality....50@50&10%
Molding.....33⅓@33⅓&10%
Toy and German.....40@40&10%
Chaplin's.....60%
Ohio Tool Co.:
Bench, First Quality.....40@40&10%
Bench, Second Quality....50@50&10%
Molding.....33⅓@33⅓&10%
Adjustable Wood Bottom.....60%
Union.....60%

Iron Planes—
Bailey's (Stanley R. & L. Co.).....40%
Chaplin's Iron Planes.....50&10%
Miscellaneous Planes (Stanley R. & L. Co.).....35%
Ohio Tool Co.'s Iron Planes.....60%
Sargent's.....60&10%
Union.....60%

Plane Irons—
Wood Bench Plane Irons.....
25&10@30%
Buck Bros.....30%
Chapin-Stephens Co.....30@30&10%
Ohio Tool Co.....30%
Stanley R. & L. Co.....35%
Union.....50%
L. & I. J. White.....20&5@25%

Planters, Corn, Hand—
Kohler's Eclipse.....℔ doz. $3.50

Plates—
Felloe.....lb. 4@4¼¢
Self-Sealing Pie Plates (R. M. Co.), ℔ doz. $2.00.....50%

Pliers and Nippers—
Button Pliers....75&10@75, 10, 5%
Gas Burner, per doz., 5 in., $1.25 @ $1.30; 6 in., $1.45 @ $1.50.
Gas Pipe.. 7 8 10 12-in.
$2.00 $2.25 $3.00 $3.75
Acme Nippers.....50&5%
Cronk & Carrier Mfg. Co.:
American Button.....75&10%
Cronk's.....60%
Stub's Pattern.....50%
Combination and others.....33⅓%
Heller's Farriers' Nippers, Pincers and Tools.....40&10@40&10&10%
The Nettleton Mfg. Co. Reversible Cutting Nippers.....40%
P., S. & W. Tinners' Cutting Nippers.....60%
Wm. Schollhorn Co.:
Bernard.....33⅓%
Elm City.....33⅓%
Lodi.....50%
Paragon.....50%
Swedish Side, End and Diagonal Cutting Pliers.....50%
Utica Drop Forge & Tool Co.:
Pliers and Nippers, all kinds.....60%

Plumbs and Levels—
Chapin-Stephens Co.:
Plumbs and Levels.....30@30&10&10%
Chapin's Imp. Brass Cor.40@40&10&10%
Pocket Levels.....30@30&10&10%
Disston's Plumbs and Levels.....70%
Disston's Pocket Levels.....70%
C. E. Jennings & Co.'s Iron.....33⅓%
C. E. Jennings & Co.'s Iron, Adjustable.....40&7½%
Stanley R. & L. Co.....40%
Stanley's Duplex.....30%
Woods' Extension.....33⅓%

Poachers, Egg—
Buffalo Steam Egg Poachers, ℔ doz., No. 1, $6.00; No. 2, $9.00; No. 3, $9.00; No. 4, $12.00.....50%

Points, Glaziers'—
Bulk and 1-lb. papers,.....lb. 10¢
½-lb. papers.....lb. 9@10½¢
¼-lb. papers.....lb. 9¾@11¢

Pokes, Animal—
Ft. Madison Hawkeye.....℔ doz. $3.25
Ft. Madison Western.....℔ doz. $1.00

Police Goods—
Manufacturers' Lists...25@25&5%
Tower's.....25%

Polish—Metal, Etc—
Glasbrite, No. 2, 5 lb can (powder), each, $1.25; ℔ doz., $12.00; No. 2, 10 lb can (cake), each, $2.50; ℔ doz., $24.00.
Prestoline Liquid, No. 1 (½ pt.), ℔ doz., $3.00; No. 2 (1 qu.), $9.72....10%
Prestoline Paste.....40%
George William Hoffman:
U. S. Metal Polish Paste, 3 oz. boxes, ℔ doz. 50¢; ℔ gro. $4.50; ½ lb boxes, ℔ doz. $1.25; 1 lb boxes, ℔ doz. $2.25.
U. S. Liquid, 8 oz. cans, ℔ doz., $1.25; ℔ gro., $12.00.
Barkeepers' Friend Metal Polish, ℔ doz., $1.75; ℔ gro., $18.00.
Wynn's White Silk, ½ pt. cans, ℔ doz.....$2.00

Stove—
Black Eagle Benzine Paste, 5 lb cans, ℔ lb 10¢
Black Eagle, Liquid, ½ pt. cans.. ℔ doz. 75¢
Black Jack Paste, ¾ lb cans, ℔ gr. $9.00
Black Kid Paste, 5 lb can....each, $0.65
Ladd's Black Beauty Liquid, per 100 tins.....$6.75
Joseph Dixon's, ℔ gr. $5.75.....10%
Dixon's Plumbago.....℔ lb 8¢
Fireside.....℔ gr. $2.50
Gem, ℔ gr. $1.50.....10%
Japanese.....℔ gr. $3.50
Jet Black.....℔ gr. $3.50
Peerless Iron Enamel, 10 oz. cans.. ℔ doz. $1.50
Wynn's:
Black Silk, 5 lb pail.....each 70¢
Black Silk, ½ lb box.....℔ doz. $1.00
Black Silk, 5 oz. box.....℔ doz. $0.75
Black Silk, ½ pt. liq.....℔ doz. $1.00

Poppers, Corn—
1 qt., Square.....gro. $9.00
1 qt., Round.....gro. $10.00
1½ qt., Square.....gro. $11.00
2 qt., Square.....gro. $13.00

Post Hole and Tree Augers and Diggers—
See also *Diggers, Post Hole, &c.*

Posts, Steel—
Steel Fence Posts, each, 5 ft., 42¢; 6 ft., 46¢; 6½ ft., 48¢.
Steel Hitching Posts.....each $1.30

Potato Parers—
See *Parers, Potato.*

Pots, Glue—
Enameled.....40%
Tinned.....35%

Powder—
In Canisters:
Duck, 1 lb.....each 45¢
Fine Sporting, 1 lb....each 75¢
Rifle, ½-lb.....each 15¢
Rifle, 1-lb.....each 25¢
In Kegs:
12½-lb. kegs.....$3.50
25-lb. kegs.....$4.50
King's Semi-Smokeless:
Keg (25 lb bulk).....$6.50
Half Keg (12½ lb bulk).....$3.50
Quarter Keg (6¼ lb bulk).....$1.90
Case 24 (1 lb cans bulk).....$8.50
Half case (1 lb cans bulk).....$4.50

King's Smokeless:	Shot Gun.	Rifle.
Keg (25 lb bulk)	$12.00	$15.00
Half Keg (12½ lb bulk)	6.25	7.75
Quarter Keg (6¼ lb bulk)	3.25	4.00
Case 24 (1 lb cans bulk)	14.00	17.00
Half case 12 (1 lb c. bk)	7.25	8.75

Robin Hood Sm'less Shot Gun..50&20%

Presses—
Fruit and Jelly—
Enterprise Mfg. Co.....20@25%

Seal Presses—
Morrill's No. 1, ℔ doz., $20.00.....50%

Pruning Hooks and Shears
See *Shears.*

Pullers, Cork—
Invincible Cork Puller.....$21.00

Pullers, Nail—
Cyclops.....50%
Miller's Falls, No. 3, ℔ doz., $12.00.. 33⅓&10%
Morrill's No. 1, Nail Puller, ℔ doz. $21.00.....50%
Pearson No. 1, Cyclone Spike Puller, each $30.00.....50%
Scranton, Case Lots:
No. 2B (large).....$5.50
No. 3B (small).....$5.00
Smith & Hemenway Co.:
Diamond B, No. 2, case lots..... ℔ doz. $6.00
Diamond B, No. 3, case lots..... ℔ doz. $5.50
Giant, No. 1, ℔ doz. $18; No. 2, $16.50; No. 3, $15.....33⅓%
Staple Pullers.....60%
Parrot Tack and Stub Puller, ℔ doz., 75c.; ℔ gro., $6.00

Pulleys, Single Wheel—

Inch	1½	1¾	2	3
Awning or Tackle, doz.	$0.30	.45	.60	1.05
Hay Fork, Swivel or Solid Eye. doz., ½ in., $1.25; 5 in., $1.55				
Inch	2	2¼	2½	
Hot House, doz.	$0.65	.85	1.20	
Inch	1¼	1½	1¾	2
Screw, doz.	$0.16	.19	.23	.30
Inch	1¾	2	2¼	2½
Side, doz.	$0.25	.40	.55	.60
Inch	1½	1¾	2	2½

Stowell's:
Ceiling or End, Anti-Friction..60&10%
Dumb Waiter, Anti-Friction..60&10%
Electric Light.....60%
Side, Anti-Friction.....60&10%

Sash Pulleys—
Common Frame; Square or Round End, per doz, 1¾ and 2 in......16@19¢
Auger Mortise, no Face Plate, per doz., 1¾ and 2 in..16@19¢
Acme.....1¾ in., 16¢; 2 in., 19¢
Fox-All-Steel, Nos. 3 and 7, 2 in.... ℔ doz. 50%
Grand Rapids All Steel Noiseless..50%
Ideal.....70&10%
Niagara.....1¾ in., 16¢; 2 in., 19¢
No. 26, Troy..1¾ in., 14½¢; 2 in., 16½¢
Star.....1¾ in., 16¢; 2 in., 19¢
Tackle Blocks—See Blocks.

Pumps—
Cistern.....60@60&10%
Pitcher Spout.....80@80&10%
Wood Pumps, Tubing, &c..45@50%
Barnes Dbl. Acting (low list).....50%
Barnes' Pitcher Spout.....75&10&5%
Contractors' Rubber Diaphragm No. 2, B. & L. Block Co.....$16.00
Daisy Spray Pump.....℔ doz. $6.75
Flint & Walling's, Fast Mail Hand, (low list).....55%
Flint & Walling's Fast Mail (low list).....55&5%
Flint & Walling's Tight Top Pitcher.80%
National Specialty Mfg. Co., Measuring, $6.00.....30%
Mechanical Sprayer.....$6.00
Myers' Pumps (low list).....50%
Myers' Power Pumps.....50%
Myers' Spray Pumps.....50&10%

Pump Leathers—
Plunger and Lower Valve—Per gro.:

Inch...	2	2¼	2½	2¾
	$2.20	2.50	2.75	3.00
Inch...	3	3¼	3½	3¾	4
	$3.30	3.60	3.85	4.10	4.40

Plunger Cup Leathers—Per 100:

Inch...	2½	3	3½	4
	$2.75	3.85	5.00	6.00

Punches—
Saddlers' or Drive, good..... *doz. 50@75¢*
Spring, single tube, good quality.....$1.75@2.00
Revolving (4 tubes)..... *doz. $3.50@3.75*
Bemis & Call Co.'s Cast St'l Drive.50%
Bemis & Call Co.'s Check.....55%
Morrill's Nos. 1AA, 1A, 1B, 1C, $15.00.....50%
Hercules, 1 die, each $5.00.....50%
Niagara Hollow Punches.....40%
Niagara Solid Punches.....55&10%
Wm. Schollhorn Co.:
Bernard.....33⅓%
Lodi.....50%
Paragon.....50%
Steel Screw, B. & K. Mfg. Co.....50%
Tinners' Hollow, P., S. & W. Co...40%
Tinners' Solid, P., S. & W. Co., ℔ doz., $1.44.....60%

Rail—Barn Door, &c.—
Sliding Door, Painted Iron.... 2½@2¾¢
Sliding Door, Wrought Brass, 1½ in., lb., 36¢.....30%
Allith Mfg. Co.:
No. 1, Reliable Hgr. Track, ℔ ft. 5½¢
No. 2, Reliable Hgr. Track, ℔ ft. 7¢
Cronk's:
Double Braced Steel Rail..℔ ft. 2¾¢
O. N. T. Rail.....2½¢
Griffin's:
xxx, ℔ 100 ft., 1 x 3-16 in., $3.00; 1¼ x 3-16 in., 3.50.
Hinged Hanger, ℔ 100 ft., 1 x 3-16 in., $3.10; 1¼ x 3-16 in., $3.60.
Lane's:
Hinged Track, ℔ 100 ft., 1 in., $3.40; 1¼ in., $4.10.
O. N. T., ℔ 100 ft., 1 in., $2.75; 1¼ in., $3.50; 1½ in., $4.00.
Standard, 1¼ in.....℔ 100 ft. $4.00
Lawrence Bros.:
℔ 100 ft., No. 201, $4.00; No. 202, $4.00
New York, 1 x 3-16 in., ℔ 100 ft. $2.75
McKinney's:
Hinged Hanger Rail, ℔ ft., 11¢..50%
None Better.....℔ ft. 3¾¢
Standard.....℔ ft. 4¢
Myers' Stayon Track.....60&10%
Richards' Mfg. Co.:
Common, 1 x 3-6 in., $3.00; 1¼ x 3-16, $3.25; 1¼ x 3-16, $3.50.
Special Hinged Hanger Rail...60&10%
Lag Screw Rail, No. 65.....50%
Gauge Trolley Track, ℔ ft., No. 31, 9¢; No. 32, 14¢; No. 33, 20¢.
No. 50.....60&10%
Nos. 61, $3.00; 62, $3.25; 63, $3.50; 64, $4.00; 45, $3.25; 46, $3.50; 49, No. 1, $3.25; 49, No. 2, $3.50.
Safety Door Hanger Co.'s Storm King Safety.....60%
Safety Door Hanger Co.'s U. S. Standard.....60%
Stowell's:
Cast Rail.....℔ ft. 1¾¢
Steel Rail, Plain.....25%
Wrought Bracket, 1 3-16 in....℔ ft. 3¢
Wrought Bracket, 1½ x 5-16..℔ ft. 7¢
Swett's Hylo, ℔ ft. 11¢.....60%
P. L. B. Steel Rail.....℔ 100 ft. $3.00
No. 0, 1 x 3-16.....℔ 100 ft. $2.75

Rakes—
NOTE.—Many goods are sold at net prices.
Fort Madison Red Head Lawn....$3.25
Fort Madison Blue Head Lawn....$2.70
Jackson Lawn, 29 and 30 teeth, ℔ doz., net.....$4.25
Cronk's:
New Champion Garden, ℔ doz., 12 teeth, $15.00; 14, $16.50; 16, $18.00..75%
Victor Garden, ℔ doz., 12 teeth, $15.00; 14, $16.50; 16, $18.00.....80%
Queen City Lawn, ℔ doz., 20 teeth, $3.45; 24, $3.60.....net.
Anticlog Lawn, ℔ doz.....$4.00
Malleable Garden.....70&10%
Kohler's:
Lawn Queen, 20-tooth.....℔ doz. $3.45
Lawn Queen, 24-tooth.....℔ doz. $3.60
Paragon, 20-tooth.....℔ doz. $2.75
Paragon, 24-tooth.....℔ doz. $3.00
Steel Garden, 14-tooth....℔ doz. $2.40
Malleable Garden, 14-tooth, ℔ doz. $1.75@2.00
Weldless Steel Garden.....75&5%

Rasps, Horse—
Disston's.....75%
Heller Bros.....70&5@70&10&5%
McCaffrey's American St'd...60&10&5%
New Nicholson.....75&10@75%
See also Files.

Razors—
Boras—I C.....60%
Fox Razors, No. 42..℔ doz. $20.00
Fox Razors, No. 44..℔ doz. $20.00
Fox Razors, No. 82, Platina... ℔ doz. $25.00
} 40% Dis.
Red Devil.....50%
Silberstein:
Carbo Magnetic.....$18.00
Griffon, No. 65.....$15.00
Griffon, No. 00.....$12.00
All other Razors.....40%

Safety Razors—
Kampfe Bros.:
Star Safety.....25%
Star Interchangeable.....25%
Star Safety Corn.....25%
Silberstein.....40%

Reels, Fishing—
Hendryx:
M 6, Q 6, A 6, B 6, M 9¼, M 16, Q 16, A 16, B 16, 4008, Rubber, Populo, Nickeled Populo.....20%
Aluminum, German Silv., Bronze.25%
1240 N, 124 N.....20%
3004 N, 06 N, 6 RM, G 9.....25%
4 N, 6 PN, 24 N, 26 PN.....20%
2904 P.....33⅓%
2904 PN.....33⅓%
0924 N.....33⅓%
02084 N.....33⅓%
002904 PN.....33⅓%
802 N.....33⅓%
986 PN, 2904 N, 974 PN.....25%
5009 PN, 5009 N.....20%
Competitor, 102 P, 102 PN, 202 P, 202 PN, 102 PR, 202 PR.....20%
304 P, 304 PN, 00304 P, 00304 PN.33⅓%

Registers—*List July 1, 1903.*
Japanned, Electroplated and Bronzed.....70&10%

Revolvers—
Single Action.....95¢@$1.00
Double Action, except ½ cal..$1.85
Double Action, ½ caliber....$2.00
Automatic.....$3.45
Hammerless.....$4.00

Riddles, Hardware Grade
16 in......*per doz.*$2.50@$2.75
17 in......*per doz.*$2.75@$3.00
18 in......*per doz.*$3.00@$3.25

Rings and Ringers—
Bull Rings—

	2	2½	3 inch.
Steel	$0.70	0.75	0.80 doz.
Copper	$1.00	1.15	1.40 doz.

Rea's Improved Self-Piercing, Copper, 2 in., ℔ doz., $1.25; 2½ in., $1.50; 3 in., $1.75.

Hog Rings and Ringers—
Hill's Rings, gro. boxes.$4.00@4.50
Hill's Ringers, Gray Iron..... *doz. 50@55¢*
Hill's Ringers, Malleable Iron.. *doz. 70@75¢*
Blair's Rings...*per gro.$4.75@5.25*
Blair's Ringers.per doz. $0.60@ .65
Brown's Rings..*per gro.$5.00@5.50*
Brown's Ringers.per doz.$0.60@ .65

Rivets and Burrs—
Copper.....45@45&5%
Iron or Steel.....75@75&5%

Bifurcated and Tubular—
Assorted in Boxes.
Bifurcated, per doz. boxes, pasteboard boxes, 23@25¢; Tin boxes, 29@32¢.
Tubular, per doz. boxes, 50 count, 29@32¢; 100 count, 51@58¢.

Rollers—
Acme, Stowell's Anti-Friction.....50%
Barn Door, Sargent's list.....60%
Cronk's Stay No. 65, $0.90; No. 50.....$1.00
Cronk's Brinkerhoff No. 55, $0.60; No. 56.....$0.84
Lane's Stay.....40%
Richards' Stay:
Handy Adj. and Reversible No. 53.75¢
O. K. Adj. and Reversible No. 58.50¢
Lag Screw, Nos. 55 and 57.....50%
Underwriters', Nos. 59, 60.....50%
Favorite, No. 54.....60%
Stowell's Barn Door Stay..℔ doz. $1.00
Swett's Anti-Friction.....50%
Screw and Spike Stay.....℔ doz. 65¢
Hinge Adjustable Stay.....℔ doz. 90¢

Rope—
Manila, 7-16 in. diam. and larger:
Pure.....lb., 12½¢
Sisal, 7-16 in. diam. and larger:
Pure.....lb., 10¢
Sisal, 7-16 in. diam. and larger:
No. 2 quality.....lb., 8
Sisal, Hay, Hide and Bale Ropes, Medium and Coarse:
Mixed.....lb., 8¢
Pure.....lb. 10¢
Sisal, Tarred, Medium Lath Yarn, Coarse and Untarred:
Mixed.....lb. 8¢
Pure.....lb. 10¢
Cotton Rope:
Best, ¼-in. and larger.16½@18¢
Medium, ¼-in. and larger, *15½@16½¢*
Common, ¼-in. and larger..10¢
In coils, ½¢ advance.
Jute Rope:
Thread No. 1, ¼-in. & up. lb.6½¢
Thread No. 2, ¼-in. & up, lb.5¾¢
Old Colony Manila Transmission Rope.....℔ lb 17½¢

Wire Rope—
Galvanized.....37½&2½%
Plain.....45&2½%

Ropes, Hammock—
Covert Mfg. Co.:
Jute.....45%
Sisal.....33⅓%
Covert Saddlery Works.....60&5%

Rulers, Desk—
Stimpson & Son:
Boxwood and Maple.....30&10%

Rules
Boxwood .....60&10&10%
Ivory .....35&10@35&10&5%
Chapin-Stephens Co.:
Boxwood .....60@60&10%
Flexifold .....27½&10&10&2½%
Ivory .....35@35&10&10%
Miscellaneous .....50@50&10&10%
Combination .....55@55&10%
Stationers' .....10@10&10%
Keuffel & Esser Co.:
Folding, Wood .....35&10%
Folding, Steel .....33⅓&10%
Lufkin's Steel .....50&10%
Lufkin's Lumber 60%
Stanley R. & L. Co.:
Boxwood 62½%
Ivory 45%
Miscellaneous 60%
Zig Zag 40%
Zig Zag, Pin Joint 42½%
Upson Nut Co.:
Boxwood .....60@60&10%
Ivory .....35&10@35&10&10%

Sash Balances—
See *Balance, Sash.*

Sash Locks—
See *Locks, Sash.*

Sash Weights—
See *Weights, Sash.*

Sausage Stuffers or Fillers
See *Stuffers or Fillers, Sausage.*

Saw Frames—
See *Frames, Saw.*

Saw Sets—See *Sets, Saw.*

Saw Tools—See *Tools, Saw.*

Saws—
Atkins':
Circular 50%
Band .....50&10@60%
Cross Cuts .....35&5%
Mulay, Mill and Drag 50%
One-Man Saw 40%
Wood Saws 40%
Hand, Compass, &c 40%
Chapin-Stephens Co.:
Turning Saws and Frames..30@30&10%
Diamond Saw & Stamping Works:
Sterling Kitchen Saws.....30&10&10%
Disston's:
Circular, Solid and Ins'ted Tooth.50%
Band, 2 to 14 in. wide 60%
Band, ¼ to 1¾ 50%
Crosscuts 50%
Narrow Crosscuts 55%
Mulay, Mill and Drag 50%
Framed Woodsaws 35%
Woodsaw Blades 35%
Woodsaw Rods 25%
Hand Saws, Nos. 12, 99, 9, 16, d100, D8, 120, 76, 77, 8 .....25%
Hand Saws, Nos. 7, 107, 107½, 3, 1, 0, 00, Combination 30%
Compass, Key Hole, &c 25%
Butcher Saws and Blades 35%
C. E. Jennings & Co.'s:
Back Saws 25%
Butcher Saws 30%
Compass and Key Hole Saws..35&5%
Framed Wood Saws 30%
Hand Saws .....20&2½%
Wood Saw Blades 35%
Millers Falls:
Butcher Saws .....15&10%
Star Saw Blades .....15&10%
Peace & Richardson's Hand Saws...30%
Simonds':
Circular Saws 50%
Crescent Ground Cross Cut Saws..35%
One-Man Cross Cuts .....40&10%
Gang Mill, Mulay and Drag Saws.50%
Band Saws 50%
Back Saws .....25@25&7½%
Butcher Saws .....35@35&7½%
Hand Saws .....25@25&7½%
Hand Saws, Bay State Brand 45%
Compass, Key Hole, &c..25@25&7½%
Wood Saws .....35@35&7½%
Springfield Mach. Screw Co.:
Diamond Kitchen Saws....40&10@50%
Butcher Saws Blades .....35@40%
Wheeler, Madden & Clemson Mfg. Co.'s Cross Cut Saws 50%

Hack Saws—
Atkins' Hack Saw Blades A A A..25%
Disston's:
Concave Blades 25%
Keystone 40%
Hack Saw Frames 30%
Fitchburg File Works, The Best...35%
C. E. Jennings & Co.'s:
Hack Saw Frames, Nos. 175, 180....40&7½%
Hack Saws, Nos. 175, 180, complete, 40&7½%
Goodell's Hack Saw Blades 40%
Griffin's Hack Saw Frames..35&5&10%
Griffin's Hack Saw Blades....35&5&10%
Springfield Mach. Screw Co.:
Diamond Hack Saw Blades.....35%
Diamond Hack Saw Frames.....50%
Star Hack Saws and Blades.....15&10%
Sterling Hack Saw Blades..30&10&5%
Sterling Hack Saw Frames..30&10&10%
Sterling Power Hack Saw Machines, each, No. 1, $25.00; No. 2, $30.00..10%
Victor Hack Saw Blades 25%
Victor Hack Saw Frames 40%

Scroll—
Barnes' No. 7, $15 .....25%
Barnes' Scroll Saw Blades 40%
Barnes' Velocipede Power Scroll Saw, without boring attachment, $18; with boring attachment, $20 .....20%
Lester, complete, $10.00 .....15&10%
Rogers, complete, $4.00 .....15&10%

Scalers, Fish—
Covert's Saddlery Works .....60&10%

Scales—
Family, Turnbull's ....50@50&10%
Counter:
Hatch, Platform, ½ oz. to 4 lbs. .....***doz. $5.50***
Two Platforms, ¼ oz. to 8 lbs. .....***doz. $16.00***
Union Platform, Plain.$1.70@1.90
Union Platform, Stpd.$1.85@2.13
Chatillon's:
Eureka 25%
Favorite 40%
Crocers' Trip Scales 50%
Chicago Scale Co.:
The "Little Detective" ....25 lbs 50%
Union or Family No. 2 .....60%
Portable Platform (reduced list)..50%
Wagon or Stock (reduced list).25@35%
"The Standard" Portables 50%
"The Standard" R. R. and Wagon..50%

Scrapers—
Box, 1 Handle .....***doz. $2.00@2.25***
Box, 2 Handle .....***doz. $2.60@2.85***
Ship ....***Light, $2.00; Heavy, $4.50***
Adjustable Box Scraper (S. R. & L. Co.), $6.00 .....45%
Chapin-Stephens Co., Box, 30@30&10&10%

Screens, Window and Frames—
Maine Screen Frames .....40&10&5%
See also *Doors.*

Screws—Bench and Hand
Bench, Iron, doz., 1 in., $2.50@2.75; 1½, $3.00@3.25; 1¼ .$3.50@3.75
Bench, W'd, Beech .doz. 30@30&5%
Hand, Wood .....*30@30&5%*
R. Bliss Mfg. Co., Hand...30@30&10%
Chapin-Stephens Co., Hand...30@30&10%
Ohio Tool Co., Bench and Hand..30%
Coach, Lag and Hand Rail—
Lag, Cone Point, list Oct. 1, '99 .....*75&15%*
Coach, Gimlet Point, list Oct. 1, '99 .....*75&10%*
Hand Rail, list Jan. 1, '81 .....*70&10@75%*

Jack Screws—
Standard List .....*80@80&5%*
Millers Falls .....50&10&10%
Millers Falls, Roller .....50&10%
P., S. & W. 50%
Sargent .....70&10%
Swett Iron Works.....75&10@80&5%

Machine—
List Jan. 1, '98:
Flat or Round Head, Iron .....*50@50&10%*
Flat or Round Head, Brass .....*50@50&10%*

Set and Cap—
Set (Iron) *80%*
Set (Steel), net advance over Iron *25%*
Sq. Hd. Cap *75%*
Hex. Hd. Cap *75%*
Rd. Hd. Cap .....*60&10%*
Fillister Hd. Cap .....*60&10&10%*

Wood—
List July 23, 1903.
Flat Head, Iron .....*87½&10@..%*
Round Head, Iron ...*85 &10@..%*
Flat Head, Brass ....*85 &10@..%*
Round Head, Brass..80 &10@..%
Flat Head, Bronze ...*77½&10@..%*
Round Head, Bronze..75 &10@..%
Drive Screws .....*87½&10%*

Scroll Saws—
See *Saws, Scroll.*

Scythes— *Per doz.*
Grass, No. 1, Plain ....*$6.25@6.75*
Clipper, Bronzed Webb..$6.50@7.00
No. 3 Clipper, Pol'd Webb .. *$6.75@7.25*
No. 6 Clipper and Solid Steel, $7.00@7.50
Bush, Weed and Bramble, No. 2. $6.50@7.00
Grain, No. 1 .....*$8.25@8.75*
Bronzed Webb, No. 1..$8.50@9.00
Nos. 3 and 4 Clipper, Grain .. *$8.75@9.25*
Solid Steel, No. 6 .....*$9.25@9.75*

Seeders, Raisin—
Enterprise .....25@30%

Sets— Awl and Tool—
Aiken's Sets, Awl and Tools:
No. 20, ₩ doz., $10.00 .....60&10%
Fray's Adj. Tool Handles, No. 1, $12; 2, $18; 3, $12; 4, $9; 5, $7 .....50%
C. E. Jennings & Co.'s Model Tool Holders 30%
Millers Falls Adj. Tool Handles, No. 1, $12; No. 4, $12; No. 5, $18....15&10%

Garden Tool Sets—
Ft. Madison Three Plows, Hoe, Rake and Shovel .....₩ doz sets $9.00

Sets, Nail—
Octagon .....*gro. $3.50@3.75*
Buck Bros. 27½%
Cannon's Diamond Point, ₩ gro.$12.40%
Mayhew's .....₩ gro. $9.90
Snell's Cor'gated, Cup Pt...₩ gro. $7.20
Snell's Knurled, Cup Pt...₩ gro. $7.20
Springfield Mach. Screw Co.:
Diamond Knurled Cup Pt.₩ gro. $7.50

Rivet—
Regular list .....*75@75&10%*

Saw—
Aiken's:
Genuine .....50&10%
Imitation .....50&10%
Atkin's:
Criterion 40%
Adjustable 40%
Bemis & Call Co.'s:
Cross Cut 30%
Plate 20%
Disston's Star and Monarch 25%
Morrill's No. 1, $15.00 .....50%
Nos. 3 and 4, Cross Cut, $20.00...50%
No. 5, Mill, $30.00 .....50%
Nos. 10, 11, 95, $15.60 .....50%
No. 1 Old Style, $10.00 .....50%
Special, $16.25 .....50%
Giant Royal Cross Cut.....₩ doz. $8.00
Royal, Hand .....₩ doz. $4.50
Taintor Positive .....₩ doz. $4.75

Shaving—
Fox Shaving Sets, No. 20 .....₩ doz., net, $24.00
Smith & Hemenway Co.'s 60%

Sharpeners, Knife—
Chicago Wheel & Mfg. Co.....75%
Pike Mfg. Co.:
Fast Cut Pocket Knife Hones, ₩ doz $1.50
Mounted Kitchen Sand Stone, ₩ doz $1.50
Natural Grit Carving Knife Hones, ₩ doz $3.00
Quick Cut Emery Carving Knife Hones, ₩ doz $1.50
Quick Edge Pocket Knife Hones, ₩ doz $2.50

Skate—
Smith & Hemenway Co. 20%

Shaves, Spoke—
Iron .....*doz.$1.10@1.25*
Wood .....*doz.$1.75@2.25*
Bailey's (Stanley R. & L. Co.).....45%
Razor Edge (Stanley R. & L. Co.)..35%
Chapin-Stephens Co.....30@30&10&10%
Goodell's, ₩ doz. $9.00 .....15&10%
Wood's F1 and F2 .....50%

Shears—

Cast Iron..	*7*	*8*	*9 in.*	
Best	*$16.00*	*18.00*	*20.00*	*gro.*
Good	*$13.00*	*15.00*	*17.00*	*gro.*
Cheap	*$5.00*	*6.00*	*7.00*	*gro.*

Straight Trimmers, &c.:
Best quality Jap ....*70@70&10%*
Best quality, Nickel..*60@60&10%*
Fair quality, Jap ....*80@80&5%*
Fair quality, Nickel..*75@75&10%*
Tailors' Shears .....*40@40&10%*
Acme Cast Shears .....40@40&5%
Heinisch's Tailor's Shears 10%
Wilkinson's Sheep, 1900 list, 30&10&5%
Grass, 50&10%; Horse or Mule, 50&10%

Tinners' Snips—
Steel Blades .....*20&5@20&10%*
Steel Laid Blades ....*40&10@50%*
Forged Handles, Steel Blades, Berlin, 50@50&5%
Heinisch's Snips 40%
Jennings & Griffin Mfg. Co.'s, 6½ to 10 in. 50%
Niagara Snips 40%
P., S. & W. Forged Handles 20%

Pruning Shears—
Cronk's Hand Shears 33⅓%
Cronk's Wood Handle Shears.....33⅓%
Disston's Combined Pruning Hook and Saw, ₩ doz. $18.00 .....25%
Disston's Pruning Hook, ₩ doz. $12.00 .....25%
John T. Henry Mfg. Co.:
Pruning Shears, all grades....50&10%
P., S. & W. Co. 33⅓%
Wilkinson's Hedge, Wilcut Brand, 60&10%
Wilkinson's Lawn and Border, Wilcut Brand .....60&10%

Sheaves—Sliding Door—
Stowell's Anti-Friction 50%
Patent Roller, Hatfield's, Sargent's list .....70&10%
Reading 40%
R. & E. list 33⅓%
Wrightsville Hatfield Pattern 80%

Sliding Shutter—
Reading list 40%
R. & E. list 33⅓%
Sargent's list .....10&10%

Shells—Shells, Empty—
Brass Shells, Empty:
Climax, Club, Rival, 10 and 12 gauge .....65&5%
Paper Shells, Empty:
Acme, Ideal, Leader, New Rapid, Magic, 10, 12, 16 and 20 gauge..25&5%
Blue Rival, New Climax, Challenge, Monarch, Defiance, Repeater, Yellow Rival, 10, 12, 16 and 20 gauge 20%
Climax, Union, League, New Rival, 10 and 12 gauge 25%
Climax, Union, League, New Rival, 14, 16 and 20 gauge 20%
Expert, Metal Lined and Pigeon, 10, 12, 16 and 20 gauge 33⅓%
Robin Hood, Low Brass .....20&5%
Robin Hood, High Brass .....30&5%

Shells, Loaded—
Loaded with Black Powder..40%
Loaded with Smokeless Powder, medium grade .....*40&5%*
Loaded with Smokeless Powder, high grade .....*40&10&10%*
Robin Hood Smokeless Powder:
Robin Hood, Low Brass 50%
Comets, High Brass .....50&10&5%

Shoes, Horse, Mule, &c.—
F.o.b. Pittsburgh:
Iron .....per keg *$4.00*
Steel .....per keg *$3.75*
Burden's, all sizes .....₩ keg $3.90

Shot—
Drop, up to B, 25-lb. bag *$1.80*
Drop, B and larger ..... *per 25-lb. bag, $2.05*
Buck, 25-lb. bag *$2.05*
Chilled, 25-lb. bag *$2.05*

Shovels and Spades—
Association List, Nov. 15, 1902..40%

Snow Shovels—
Long Handle .....*$2.75@3.00*
Wood and Mall, D. Handle. *$3.25@3.50*

Sieves and Sifters—
Hunter's Imitation ..... *gro. $9.50@10.00*
Hunter's Genuine ..... *per gro. $12.00@12.50*
Buffalo Metallic Blued, R. M. Co., ₩ gr.

14&16	16&18	18&20
$13.20	$13.50	$14.40

Shaker (Barler's Pat.) Flour Sifters, ₩ doz. $2.00 .....20%

Sieves, Seamless Metallic

	Per dozen.			
Mesh	*14*	*16*	*18*	*20*
Iron Wire....	*$1.05*	*1.05*	*1.10*	*1.20*
Tinned Wire.	*$1.15*	*1.15*	*1.20*	*1.30*

Sieves, Wooden Rim—
Nested, 10, 11 and 12 Inch.
Mesh 18, Nested ....*doz. $0.90@0.95*
Mesh 20, Nested ....*doz. $1.00@1.05*
Mesh 24, Nested ....*doz. $1.30@1.40*

Sinks, Cast Iron—
Painted, Standard list:
12 x 12 to 22 x 36 in ....*60&5%*
20 x 40 to 24 x 50 in *55%*
24 x 60 to 24 x 120 in *35%*
Barnes' low list:
Up to and including 20 x 36 in....60%
20 x 40 to 24 x 50 in 55%
NOTE.—There is not entire uniformity in lists used by jobbers.

Skeins, Wagon—
Cast Iron .....*80@80&10%*
Steel .....*40@40&10%*

Slates, School—
Factory Shipments.
"D" Slates .....*50@50&10%*
Eureka, Unexcelled Noiseless.. 60&5 tens
Victor A, Noiseless..60&4 tens &5%

Slaw Cutters—See *Cutters.*

Snaps, Harness—
German .....*40@40&10%*
Covert Mfg. Co.:
Derby .....30&2%
High Grade 45%
Jockey 35%
Trojan 45%
Yankee .....30&2%
Yankee Roller .....30&2%
Covert's Saddlery Works:
Crown 60%
German 60%
Model 60%
Triumph 60%
Oneida Community:
Harness Snaps, 1 inch .....60&5%
Swivel Snaps 60%
Swivels 50%
Sargent's Patent Guarded....66⅔&10%

Snaths—
Scythe *50%*

Snips, Tinners—See *Shears.*

Spoons and Forks—
Silver Plated—
Good Quality .....*50&10@60&5%*
Cheap .....*60@60&10%*
International Silver Co.:
1847 Rogers Bros. and Rogers & Hamilton .....40&10%
Rogers & Bro., William Rogers' Eagle Brand .....50&10%
Anchor, Rogers Brand 60%
Wm. Rogers & Son .....60&10%

Miscellaneous—
German Silver .....*60@60&5%*
Cattaraugus Cutlery Co.:
Seneca Silver 50%

Tinned Iron—
Teas .....*per gro. 45@50¢*
Tables .....*per gro.$0.50@$1.00*

Springs— Door—
Chicago (Coil) .....40&10%
Gem (Coil) 20%
Pullman (Coil) 25%
Reliance (Coil) .....40&10%
Star (Coil) 30%
Torrey's Rod, 39 in. .....₩ doz. $1.10
Victor (Coil) .....50&10&10%

Carriage, Wagon, &c.—

1¼ in. and Wider:	*Per lb.*
Black	*4@4¼¢*
Half Bright	*4@4¼¢*
Bright	*4½@4¾¢*

Painted Seat Springs:
1½ x 2 x 26 .....*per pr. 42¢*
1½ x 3 x 28 .....*per pr. 70¢*

Sprinklers, Lawn—
Enterprise .....25@30%
Philadelphia No. 1, ₩ doz. $12; No. 2, $15; No. 3, $24 .....30%
Pleuger & Henger Mfg. Co.:
Cactus 70%
Japanese 75%
Nationals 65%

Squares—
Nickel plated.. } *List Jan. 5, 1900.*
Steel and Iron.. } *75&10@75&10&5%*
Rosewood Hdl. Try Square and T-Bevels .....*60&10&10@70%*
Iron Hdl. Try Squares and T-Bevels .....*40&10@40&10&10%*
Disston's Try Sq. and T-Bevels....70%
Winterbottom's Try and Miter, No. 1, 40%; No. 2 .....50%

Squeezers, Lemon
Wood, Common, gro., No. 0, $5.25@$5.50; No. 1, $6.25@$6.50.
Wood, Porcelain Lined:
Cheap .....*doz. $1.00*
Good Grade .....*doz. $1.25*
Tinned Iron .....*doz. $0.75@1.25*
Iron, Porcelain Lined...*doz. $1.75*

Staples—
Barbed Blind .....*lb. 6@6¼¢*
Electricians', Association list.. *80&10&10&10%*
Fence Staples, Plain, $2.25; Galvanized *$2.55*
Poultry Netting Staples..... *per lb. 3¼@3½¢*
Grand Crossing Tack Co.'s list..80&10%

Steels, Butchers'—
Dick's 30%
Foster Bros. 30%
C. & A. Hoffmann's 40%

Steelyards— ....30@30&10%

Stocks and Dies—
Blacksmiths' .....*50@50&10%*
Curtis Rev'ble Ratchet Die Stock..25%
Derby Screw Plates 25%
Green River 25%
Lightning Screw Plate 25%
Little Giant 25%
Reece's New Screw Plates 25%

Stoners, Cherry—
Enterprise .....25@30%

Stones—Oil, &c.
Chicago Wheel & Mfg. Co., 1904 list:
Gem Corundum Oil, Double Grit.60%
Gem Corundum Axe, Single or Double Grit 60%
Gem Corundum Slips 60%
Gem Corundum Razor Hones....50%
Pike Mfg. Co., 1904 list: ₩ lb.
Arkansas St. No. 1, 3 to 5½ in.$2.00
Arkansas St. No. 1, 5½ to 8 in.$3.50
Arkansas Slips No. 1 .....$4.00
Lily White Washita, 4 to 8 in.60¢
Rosy Red Washita, 4 to 8 in..60¢
Washita St., Extra, 4 to 8 in.50¢
Washita St., No. 1, 4 to 8 in.40¢
Washita St., No. 2, 4 to 8 in.30¢
Lily White Slips .....90¢
Rosy Red Slips .....90¢
Washita Slips, Extra .....80¢
Washita Slips, No. 1 .....70¢
Washita Slips, No. 2 .....40¢
India Oil Stones (entire list)....33¼%
Quickcut Emery and Corundum Oil Stone, Double Grit 33¼%
Quickcut Emery and Corundum Axe Stone, Double Grit 33¼%
Quickcut Emery Rubbing Bricks.33¼%

Hindostan No. 1, R'g'lar. ₱ lb 8¢
Hindostan No. 1, Small.. ₱ lb 10¢
Axe Stones (all kinds)
Turkey Oil Stones, Extra, 5 to 8 in. ₱ lb 80¢
Queer Creek Stones, 4 to 8 in. 30¢
Queer Creek Slips 40¢
Sand Stone 6¢
} 33⅓%

Scythe Stones—

Chicago Wheel & Mfg. Co.:
Gem Corundum, 10 in., $8.00 ₱ gro., 12 in., $10.80.
Norton Emery Scythe Stones:
Less than gross lots ₱ gro. $9.00
One gross or more ₱ gro. $7.20
Lots of 10 gross or more ₱ gro. $6.00
Pike Mfg. Co., 1901 list:
Black Diamond S. S. ₱ gro. $12.00
Lamoille S. S. ₱ gro. $11.00
White Mountain S. S. ₱ gro. $9.00
Green Mountain S. S. ₱ gro. $6.00
Extra Indian Pond S.S. ₱ gro. $7.50
No. 1 Indian Pond S.S. ₱ gro. $7.00
No. 2 Indian Pond S.S. ₱ gro. $4.50
Leader Red End S. S. ₱ gro. $4.50
Quick Cut Emery ₱ gro. $10.00
Pure Corundum ₱ gro. $18.00
Crescent $7.00
Emery Scythe Rifles, 2 Coat, $8
Emery Scythe Rifles, 3 Coat, $10
Emery Scythe Rifles, 4 Coat, $12
Balance of 1904 list 33⅓%

Stoppers, Bottle—

Victor Bottle Stoppers ₱ gro. $9.00

Stops— Bench—

Millers Falls 15&10%
Morrill's ₱ doz., No. 1, $10.00 50%
Morrill's, No. 2, $12.50 50%

Door—

Chapin-Stephens Co. 40@40&10%

Plane—

Chapin-Stephens Co. 20%

Straps— Box—

Cary's Universal, case lots 25&20%

Hame—

Covert's Saddlery Works 60&10%

Stretchers, Carpet—

Cast Iron, Steel Points, doz. 60@60&10%
Socket .doz. $1.60
Bullard, ₱ doz. $4.00
Excelsior Stretcher and Tack Hammer Combined, ₱ doz. $6.00 20%

Strops, Razor—

Star Diagonal Strop 25%

Stuffers, Sausage—

Enterprise Mfg. Co. 25@25&7½%
National Specialty Co., list Jan. 1, 1902 50&5%

Sweepers, Carpet—

National Sweeper Co.: ₱ doz.
Louis XV, Roller Bearing, Gold Plated $120.00
Hepplewhite, Roller Bearing, Silver Plated $72.00
Sheraton, Roller Bearing, N'kel. $60.00
Ye Mission, Roller Bearing, Oxidized Coppered $36.00
Transparent, Roller Bearing, Plate Glass top, Nickeled $36.00
National Queen, Roller Bearing, Fancy Veneers $27.00
Loyal, Roller Bearing, Veneers, Nickeled $25.00
Triple Medal, Roller Bearing, Nickeled $24.00
Marion, Roller Bearing, N'kel. $24.00
Marion Queen, Roller Bearing, Nickeled $24.00
Monarch, Roller Bearing, N'kel. $22.00
Monarch, Roller Bearing, Jap. $20.00
Perpetual, Regular B'r'gs, N'kel. $20.00
Perpetual, Regular B'r'gs, Jap. $18.00
Monarch Extra (17 in. case), Roller Bearing, Nickeled $36.00
Monarch Extra (17 in. case), Roller Bearing, Japanned $33.00
Auditorium (26 in. case), Roller Bearing, Nickeled $34.00
Mammoth (30 in. case), Roller Bearing, Nickeled $60.00

NOTE.—Rebates: 50c per dozen on three-dozen lots; $1 per dozen on five-dozen lots; $2 per dozen on ten-dozen lots; $2.50 per dozen on twenty-five-dozen lots.

Streator Metal Stamping Co.:
Model E, Sanitaire ₱ doz $25.00
Model A, Sterling ₱ doz. $25.00
Model B, Sterling, Nickeled ₱ doz. $23.00
Model B, Sterling, Japanned ₱ doz. $21.00
Model C, Sterling ₱ doz. $21.50
Model D, Sterling ₱ doz. $19.50

Tacks, Finishing Nails, &c.

New List, May 1, 1905.

American Carpet Tacks 90¢40¢—%
American Cut Tacks 90¢40¢—%
Swedes Cut Tacks 90¢40¢—%
Swedes Upholsterers' 90¢50¢—%
Gimp Tacks 90¢50¢—%
Lace Tacks 90¢40¢—%
Trimmers' Tacks 90¢40¢—%
Looking Glass Tacks 65¢—%
Bill Posters' and Railroad Tacks, 90¢50¢—%
Hungarian Nails 85¢—%
Finishing Nails 70¢10¢—%
Trunk and Clout Nails 80¢—%

NOTE.—The above prices are for Standard Weights. An extra 5% is given on Medium Weights, and an extra 10&2½ is given on light weights.

Miscellaneous—

Double Pointed Tacks 90¢5 or 6 tens

See also Nails, Wire.

Tanks, Oil—

	Each.
Emerald, R. M. Co.	30-gal. $3.40
Emerald, R. M. Co.	60-gal. $4.25
Queen City, R. M. Co.	30-gal. $3.65
Queen City, R. M. Co.	60-gal. $4.50

Tapes, Measuring—

American Asses' Skin 50¢—%
Patent Leather 25@50&5%
Steel 33 1-3&5%
Chesterman's 25@25&5%
Eddy Asses' Skin 40&10@50%
Eddy Patent Leather 25@30&5%
Eddy Steel 40@40&10%

Keuffel & Esser Co.:
Favorite, Ass Skin 40&10@50%
Favorite, Duck and Leather 25&5@25&10%
Metallic and Steel, lower list 35@35&5%
Pocket 35@35&5%
Lufkin's:
Asses' Skin 40&10@50%
Metallic 30@30&5%
Patent Bend, Leather 25&5@25&10%
Pocket 40@40&5%
Steel 33⅓@35%

Teeth, Harrow—

Steel Harrow Teeth, plain or headed, ⅝-inch and larger per 100 lbs. $2.75@$3.00

Thermometers—

Tin Case 80&10@80&10&5%

Ties, Bale—Steel Wire—

Single Loop 80&2½%
Monitor, Cross Head, &c. 70%

Brick Ties—

Niagara Brick Ties 25&10%

Tinners' Shears, &c.—

See *Shears, Tinners', &c.*

Tinware—

Stamped, Japanned and Pieced, sold very generally at net prices.

Tips, Safety Pole—

Covert's Saddlery Works 60&10%

Tire Benders, Upsetters, &c.

See *Benders and Upsetters, Tire.*

Tools—Coopers'—

L. & I. J. White 20@20&5%

Hay—

Myers' Hay Tools 50%
Stowell's Hay Carriers 50%
Stowell's Hay Forks 50%
Stowell's Fork Pulleys 50%

Miniature—

Smith & Hemenway Co.'s 25%

Saw—

Atkins' Cross Cut Saw Tools 40%
Simonds' Improved 33⅓%
Simonds' Crescent 25%

Ship—

L. & I. J. White 25%

Transom Lifters—

See *Lifters, Transom.*

Traps—Fly—

Balloon, Globe or Acme, doz. $1.15@$1.25; gro. $11.50@12.00
Harper, Champion or Paragon, doz. $1.25@1.40; gro. $13.00@13.50

Game—

Imitation Oneida 75@75&5%
Newhouse 40@45&5%
Hawley & Norton 65%
Victor 70&10%
Oneida Community Jump 50%

Mouse and Rat—

Mouse, Wood, Choker, doz. holes 8½@9¢
Mouse, Round or Square Wire, doz. 85@90¢

Marty French Rat and Mouse Traps (Genuine):
No. 1, Rat, each $1.21; ₱ doz. $13.25
No. 3, Rat, ₱ doz. $6.50; case of 50
No. 3½, Rat, ₱ doz. $5.25; case of 72 $5.75 doz.
No. 4, Mouse, ₱ doz. $3.85; case of 150 ₱ gro. $4.70 doz.
No. 5, Mouse, ₱ doz. $3.00; case of 150 $3.00 doz.

Trimmers, Spoke—

Wood's E 1 $2.25 doz. 50%

Trowels—

Disston Brick and Pointing 30%
Disston Plastering 25%
Disston "Standard Brand" and Garden Trowels 35%
Kohler's Steel Garden Trowels, 5 in. ₱ gro. $4.80
Kohler's Steel Garden Trowels, 6 in. ₱ gro. $6.00
Never-Break Steel Garden Trowels ₱ gro. $6.00
Rose Brick and Plastering 25&5%
Woodrough & McParlin, Plastering 25%

Trucks, Warehouse, &c.—

B. & L. Block Co.:
New York Pattern 50&10%
Western Pattern 60&10%
Handy Trucks ₱ doz. $16.00
Grocery ₱ doz. $15.00
Dairy Store Trucks, Improved Pattern ₱ doz. $18.50
McKinney Trucks each $10.00
Model Stove Trucks ₱ doz. $18.50

Tubs, Wash—*No. 1 2 3*

Galvanized, per doz. $4.25 4.75 5.25
Galvanized Wash Tubs (R. M. Co.):
No. 1 2 3
Per doz., net $5.70 6.30 7.20 6.60 7.20 8.10

Twine, Miscellaneous—

Flax Twine:	BC.	B.
No. 9, ¼ and ½-lb. Balls	22@24¢	
No. 12, ¼ and ½-lb. Balls	18@20¢	
No. 18, ¼ and ½-lb. Balls	16@18¢	
No. 24, ¼ and ½-lb. Balls	16@18¢	
No. 36, ¼ and ½-lb. Balls	15@17¢	
Chalk Line, Cotton ½-lb. Balls	25@30¢	
Cotton Mops, 6, 9, 12 and 15 lb. to doz.	10@18¢	
Cotton Wrapping, 5 Balls to lb., acording to quality	14½@20¢	
American 2-Ply Hemp, ¼ and ½-lb. Balls	13@14¢	
American 3-Ply Hemp, 1-lb. Balls	13@14¢	
India 2-Ply Hemp, ¼ and ½-lb. Balls (Spring Twine)	8½¢	
India 3-Ply Hemp, 1-lb. Balls	8½¢	
India 3-Ply Hemp, 1½-lb. Balls	7@8¢	
2, 3, 4 and 5-Ply Jute, ½-lb. Balls	9@10¢	
Mason Line, Linen, ½-lb. Bls	46¢	
No. 25½ Mattress, ¼ and ½-lb. Balls	37¢	
Wool, 3 to 6 ply	B 6¢	A 6½¢

Vises—

Solid Box 60%

Parallel—

Athol Machine Co.:
Simpson's Adjustable 40%
Standard 40%
Amateur 25%
Columbian Hdw. Co. 40%
Emmert Universal:
Pattern Makers' No. 1, $15.00; No. 2, $12.50.
Machinist and Tool Makers' No. 4A, $12.50; No. 5A, $7.00; No. 6A, $10.00; No. 10A, $22.50.
Presto Quick Acting 25@25&5%
Tiger Machinists' 40%
Fisher & Norris Double Screw 15&10%
Hollands':
Machinists' 40@40&5%
Keystone 65&5@70%
Lewis Tool Co.:
Adjustable Jaw 30%
Monarch 50%
Solid Jaw 50%
Massey Vise Co.:
Clincher 40%
Perfect 20%
Lightning Grip 20%
Merrill's 20%
Millers Falls 60&10%
Parker's:
Victor 20@25%
Regulars 20@25%
Vulcan's 40@45%
Combination Pipe 55@60%
Prentiss 20@25%
Sargent's 40%
Snediker's X. L. 33⅓%
Stephens' 33⅓%
Williamson Mfg Co, Double Swivel 40&5%

Saw Filers—

Disston's D 3 Clamp and Guide, ₱ doz. $30. 25%
Perfection Saw Clamps, ₱ doz. $4.50
Reading 60%
Wentworth's Rubber Jaw, Nos. 1, 2 and 3. 45&50%

Wood Workers—

Massey Vise Co.:
Lightning Grip 15%
Perfect 15%
Wyman & Gordon's Quick Action, 6 in., $6.00; 9 in., $7.00; 14 in., $8.00.

Miscellaneous—

Bignall & Keeler Combination Pipe Vise 60&10%
Holland's Combination Pipe. 60@60&5%
Massey's Quick Action Pipe 40%
Parker's Combination Pipe:
87 Series 60%
187 Series 60&5%
No. 870 40%
Williamson Mfg. Co, Double Swivel Combination Pipe 40&5%

Wads—*Price per M.*

B. E., 11 up	60¢
B. E., 9 and 10	70¢
B. E., 8	80¢
B. E., 7	80¢
P. E., 11 up	$1.00
P. E., 9 and 10	1.25
P. E., 8	1.50
P. E., 7	1.50

Dis. 15%

Ely's B. E., 11 and larger $1.70@1.75
Ely's P. E., 12 to 20 $3.00@3.25

Ware, Hollow—

Cast Iron, Hollow—

Stove Hollow Ware:
Enameled 55%
Ground 60%
Plain or Unground 65%
Country Hollow Ware, per 100 lbs. $2.75
White Enameled Ware:
Maslin Kettles 70%
Covered Wares
Tinned and Turned 40%
Enameled 50%
See also *Pots, Glue.*

Enameled—

Agate Nickel Steel Ware 60%
Iron Clad Ware 70&10%
Lava, Enameled 40&10%
Never Break Enameled 50%

Tea Kettles—

Galvanized Tea Kettles:

Inch	6	7	8	9
Each	45¢	50¢	55¢	65¢

Steel Hollow Ware—

Avery Spiders and Griddles 65@65&5%
Avery Kettles 60%
Porcelained 50&30&10%
Never Break Spiders and Griddles. 65&5%
Never Break Kettles 60%
Solid Steel Spiders and Griddles. 65&5%
Solid Steel Kettles 60%

Warmers, Foot—

Pike Mfg. Co., Soapstone 40@40&10%

Washboards—

Solid Zinc: ₱ doz.
Crescent, family size, bent frame $3.25
Red Star, family size, stationary protector $3.25
Double Zinc Surface:
Saginaw Globe, family size, stationary protector $2.90
Cable Cross, family size, stationary protector $3.15
Single Zinc Surface:
Naiad, family size, open back, perforated $2.65
Saginaw Globe, protector, family size, ventilated back $2.50
Brass Surface:
Brass King, Single Surface, open back $3.25
Nickel Plate Surface:
No. 1001 Nickel Plate, Single Surface $3.25
Glass Surface:
Glass King, Single Surface, open back $3.25
Enamel Surface:
Enamel King, Single Surface, ventilated back $3.25

Washers—Leather, Axle—

Solid 80&10@80&10&10%
Patent 90@90&5%
Coil: ¼ 10¢ ½ 11¢ 1¼ 12¢ 1¼ Inch. 13¢ per box

Iron or Steel—

Size bolt 5-16 ⅜ ½ ⅝ ¾
Washers $5.70 4.80 3.50 3.30 3.10

The above prices are based on 5.70¢ off list.

In lots less than one keg add ½¢ per lb.; 5-lb. boxes add ½¢ to list.

Cast Washers—

Over ½ inch, barrel lots per lb. 1½@2¢

Weather Strip—

Flexible Felt—

Lined, per 100 ft., $2; $3; $4 40&10%
Moore's Unlined, per 100 ft., $2; $3; $4 50&10%

Wedges—

Oil Finish lb. 2.70@2.80¢

Weights—Hitching—

Covert Mfg. Co. 40%
Covert's Saddlery Works 60&10%

Sash—

Per ton, f.o.b. factory:
Eastern District $27.50@$28.00
Southern Territory $20.00@$23.00
Western and Central Districts $23.00@$25.00

Wheels, Well—

8-in., $1.55; 10-in., $2.00; 12-in., $2.50; 14-in., $4.00.

Wire and Wire Goods—

Bright and Annealed:
6 to 9 80%
10 to 18 80&2½%
19 to 26 80&7½%
27 to 36 80&2½%
Galvanized:
6 to 9 75&5%
10 to 14 75&7½%
15 to 16 72½&10&2½%
19 to 26 75%
27 to 36 72½%
Coppered:
6 to 9 75&5%
10 to 14 75&7½%
15 to 18 72½&10&2½%
19 to 26 75&10&5%
27 to 36 75%
Tinned:
6 to 14 75&10&2½%
15 to 18 75&7½%
Annealed, Steel and Tinned, on Spools 70&10&10@70&10&10&10%
Brass and Copper on Spools 60&5@60&10&5%
Brass, list Feb. 26, '96 15%
Copper, list Feb. 26, '96 25%
Cast Steel Wire 50%
Wire Clothes Line, see Lines.
Wire Picture Cord, see Cord.

Bright Wire Goods—

List June 24, '03 90&25@90&30%
Brass Cup Hooks and Brass Screw Hooks 85&10%

Wire Cloth and Netting—

Galvanized Wire Netting 80&5@80&10%
Painted Screen Cloth, 100 ft. $1.00@1.10
Standard Galv. Hardware Grade:
Nos. 2, 2½ & 3 Mesh, sq. ft. 3 ¢
Nos. 4 and 5 Mesh, sq. ft. 3½¢
No. 6 Mesh, sq. ft. 3½¢
No. 8 Mesh, sq. ft. 4 ¢

Wire, Barb—See *Trade Report*

Wrenches—

Agricultural 75&10&5@80%
Alligator or Crocodile 70&10@75%
Baxter Pattern S Wrenches 70&5@70&10%
Drop Forged S 45@45&5%
Acme 60&10%
Alligator Pattern 70%
Bull Dog 70%
Bemis & Call's:
Adjustable S 40%
Adjustable S Pipe 40%
Bemis Pipe 60%
Briggs Pattern 40%
Combination Black 40&5%
Combination Bright 40%
Merrick Pattern 50%
Boardman's 40%
Coes' Genuine Knife Hdl. 40&10&5&5%
Coes' Genuine Steel Hdl. 40&10&5&5%
Coes' Genuine Key Model. 40&10&5&5%
Coes', Genuine Hammer Handle 40&10&5&5%
Coes' "Mechanics'" 40&10&10&5&5%
Donohue's Engineer 40&10%
Eagle 50&10%
Elgin Wrenches, ₱ doz. $6.25
Elgin Rethreading Attachment, one die, ₱ doz. $6.25
Elgin Extra Dies, ₱ doz. $3.00
Elgin Extra Jaws, ₱ doz. $1.75
Elgin Monkey Wrench Pipe Jaws, ₱ doz. $2.10
Gem Pocket 20%
Hercules 70%
W. & B. Machinist:
Case lots 50&5%
Less than case lots 50%
W. & B. Railroad Special:
Case lots 50%
Less than case lots 40&10&5%
Solid Handles, P., S. & W. 50&10@60
Stillson 65%
Vulcan Chain 50%

Fruit Jar—

Triumph Fruit Jar Wrench, 5 gross lots, ₱ gross, $7.50; ₱ doz. $0.80

Wringers—

Tuttle Roller Press Mop Pail Wringer, each, $8.00; ₱ doz. $48.00

Wrought Goods—

Staples, Hooks, &c., list March 11, '92 90@90&10%

Yokes, Neck—

Covert Saddlery Works, Trimmed. 70%
Covert Saddlery Works, Neck Yoke Centers 70%

Yokes, Ox, and Ox Bows—

Fort Madison's Farmers' & Freighters' list net

Zinc—

Sheet per 100 lbs., $8.00@8.25

For the Table of "Current Metal Prices" see the First Issue of Every Month.